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Some Observations
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Delivered at the Royal Society of Medicine on Nov. 13th, 1918,

BY HAROLD E. WHITTINGHAM, M.B., CH.B. GLASG.,
CAPTAIN, R.A.M.C. (T.C.), ATTACHED R.A.F.; BACTERIOLOGIST, R.A.F. CENTRAL HOSPITAL, HAMPSTEAD;
AND
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R.A.M.C. (ATTD.); BACTERIOLOGIST, MILITARY HOSPITAL, HAMPSTEAD.

THE following investigations were undertaken to ascertain whether the present October "influenzal" epidemic and the July "Spanish plague" were due to one and the same micro-organism or group of organisms.

That the causal organisms were not the same in both cases was suggested by the distinct difference in the signs and symptoms, the physical signs of pulmonary involvement being marked in the present disease, but only transient or absent in the July epidemic. A dry hacking cough is an early symptom; in fact, often the only one of which the patient complains. Moreover, in July the febrile period frequently lasted three, and more rarely six, days; in the present disease the febrile period is longer—seven to fourteen days—and the temperature higher throughout. In short, pharyngitis and laryngitis, with marked nervous prostration, distinguished the earlier epidemic; bronchitis and broncho-pneumonia, with septicæmia, the plague now with us.

The varying reports that have been published concerning influenza in the last four months must cause the general public to remark, "Doctors always differ!" but the professional mind wonders if all observers have been studying one and the same disease. There is a distinct tendency when an epidemic disease is raging to assign all maladies to the one common origin. Thus many pyrexias of sudden onset, such as acute tonsillitis, lobar pneumonia, cerebro-spinal fever, are labelled "influenza." In the following notes we wish to emphasise the fact that we are dealing with a "compound" disease.

Over a hundred cases were examined as regards the micro-organisms present in the posterior nasal swabs and sputa. The urine of these cases was also examined on several occasions. As blood cultures were performed on only the first 50 of the cases admitted to the two hospitals in which we worked, we have based all our figures on these 50 cases. Taking each case as admitted, whether mild or severe, gives as fair a picture as possible of the pathological findings of the disease.

Fortunately the cases dealt with in this paper are directly comparable to those reported on in July.[1] In both epidemics the patients were Royal Air Force officers and cadets from the same district and living under similar conditions.

BLOOD CULTURES.

Blood cultures were performed on 50 cases.

In each case 10 c.cm. of blood was added to 100 c.cm. of citrated broth and incubated at 37° C. for eight days. Several loopfuls of each broth culture were sown daily on blood agar and slides made in case micro-organisms were present which would not subculture.

Positive results were obtained in 7 of the cases (i.e., 14 per cent.); of these, 5 proved to be streptococcus, 1 pneumococcus, and 1 resembled the *Diplococcus mucosus* of Stephan.[2]

The streptococci varied as regards the first day on which subcultures could be obtained from the broth cultures. Four days was the longest period; in one case the growth of streptococci in the original broth culture was very abundant in 24 hours. The pneumococcus was subcultured out after two days in broth, the *diplococcus mucosus* after three days.

Three of the streptococci isolated hæmolysed distinctly and two slightly. Only one of these grew in long chains in broth, the rest being short and arranged more or less in diplococcal formations. Growth on agar at 20° C. was slow and poor, at 37° C. moderate. All grew well on blood agar, giving typical colonies, in two the viridans type. Inulin was not fermented. Capsule formation absent. Acid and clot in milk on the second to third day. Only two of these streptococci were subjected to animal experimentation. Both organisms proved to be non-pathogenic to young rabbits when inoculated subcutaneously.

The pneumococcus was quite characteristic—capsule formation was present and inulin fermented. A young rabbit inoculated subcutaneously in the flank died in 30 hours. Pneumococci were found abundant in the heart's blood; there was marked congestion of trachea and lungs, petechial hæmorrhages of pleura and peritoneum, especially the latter, and fluid pus in the peritoneal sac.

The *diplococcus mucosus* when first isolated appeared as a Gram-negative diplococcus (each coccus measuring about 0·7 to 1 μ in diameter), very similar to the meningococcal group, except that there was a distinct capsule. When incubated at 37° C. it grew as small, rounded, semi-transparent, pin-head colonies on blood agar and even on agar in 24 hours; at 20° C. it grew visibly in 40 hours. The colonies became somewhat granular after 48 hours.

Smears made from the second subculture onwards showed the organism to be very pleomorphic; in places it appeared as rounded, in others as oval diplococci, while at times small bacillary forms were seen. The staining with Gram's was variable in the same smear, some of the cocci being distinctly positive and others negative. The bacillary forms were Gram negative.

That these were not influenza bacilli is evident from their growth on ordinary agar, and also from the fact that they stained readily with 1 in 10 fuchsin in ten to twenty seconds. A contamination was suspected, but these small bacillary and variable Gram staining forms were found when individual plate colonies were examined.

In broth there was distinct general turbidity in 24 hours; this cleared somewhat on the third day, and a fine powdery deposit covered the bottom of the tube. Acid was produced in glucose, saccharose, maltose, lævulose, and galactose, but not in lactose, mannite, dulcite, or inulin. Litmus milk on the second day showed slight acid reaction and slight basal clot formation, which became more marked on the following day. There was only slight hæmolysis of blood media.

Experimental inoculation, intravenously and subcutaneously, into young rabbits proved the organism to be non-pathogenic to these animals. It should be noted that the patient died from whom this organism was isolated. Unfortunately a post-mortem examination could not be obtained.

Note.—At one period of these investigations blood from some of the cases which gave a negative result on culture was used to make blood agar. The growth of some of our stock cultures was poor on this media, so two series of blood agar tubes were put up, one series being made from the blood of apparently normal individuals, the other from the blood of influenza patients. *B. influenzæ*, pneumococcus, streptococcus, and meningococcus isolated from cases under investigation, were implanted into tubes of the first and second series respectively. The result, read at the end of 48 hours, was a good growth of all the organisms in the normal blood series, while in the influenza blood series practically no growth of the *B. influenzæ* occurred and only comparatively feeble growths of the pneumococcus, streptococcus, and meningococcus. This result, at least as regards the *B. influenzæ*, was to be expected. The experiment is mentioned to emphasise the fallacy of using blood from "influenza" patients to make up media for the isolation of the micro-organisms in such an epidemic.

Of the 50 cases death occurred in 7, 5 of which gave positive blood cultures during life (streptococcus in 4, *D. mucosus* in 1)—i.e., 71 per cent. of the cases in which micro-organisms were isolated from the blood died. Amongst the patients giving a negative blood culture 2 died—i.e., 4·6 per cent. Of these, one was a case of cerebro-spinal meningitis; the other of purulent bronchitis with pleurisy and peritonitis. From the latter case streptococcus was isolated from the heart's blood at the post-mortem; so probably if blood cultures had been made on this patient late in the disease a positive result would have been obtained.

The day of disease on which the various blood cultures were made and the results of culture are shown in Table I. A glance at these figures would suggest that if all the blood cultures had been taken on the sixth or seventh day of disease many more positive results would have been obtained. As it is, there are not enough figures to go by, but, in considering the table, one must bear in mind that the bloods cultured on the sixth and seventh days were from those patients who were progressing badly and already in a markedly toxic condition.

In the July epidemic[1] blood cultures were repeatedly negative, except on two occasions when Gram-negative diplococci were found, which would not subculture.

TABLE I.—*Results of Blood Cultures in 50 Cases.*

Day of disease.	1	2	3	4	5	6	7	Total.
Cases cultured ...	10	14	16	2	5	1	2	50
,, positive ...	—	1	2	—	1	1	2	7
Per cent. ,, ...	0	7	12·5	0	20	100	100	14

We have repeatedly observed, both in this and the previous epidemic, that after the withdrawal of 10–20 c.cm. of blood early in the disease, for culturing purposes, there is a distinct fall in the temperature. We mention this as a point worthy of note for clinicians.

THROAT SWABS AND SPUTUM.

Posterior nasal swabs were examined from 50 cases.

In each case direct smears and plate cultures were made. In those cases where there was expectoration the sputum was examined—23 out

of the 50 cases. The sputum to be cultured was first well washed in sterile salt solution. The plates were examined at the end of 24 and 48 hours' incubation at 37° C.

TABLE II.—*Bacteriology of Sputa and Throat Swabs.*

Direct smears.	Cases.	*Cultures.*	Cases.
Diplococci—		*M. catarrhalis*	36
Gram −	49	Pneumococcus	33
,, + ...	50	Streptococcus	40
Cocci, Gram + ...	21	Staphylococcus	27
Bacilli—		*B. influenzæ*	23
Pfeiffer-like	36	*B. septus*	10
Coliform	34	Pneumobacillus	8

TABLE III.—*Percentages of Cases in which Organisms were Present.*

—	(1)	(2)	(3)	—	(1)	(2)	(3)
Pneumococcus	65%	58%	66%	*M. catarrhalis*	65%	70%	72%
Streptococcus	82 ,,	76 ,,	80 ,,	Meningococcus	—	8 ,,	8 ,,
B. influenzæ	54 ,,	38 ,,	46 ,,	Staphylococcus	44 ,,	52 ,,	54 ,,

(1) Sputum (23 cases). (2) Throat swabs (50 cases). (3) Combined sputum and throat swabs.
Only the chief micro-organisms are shown.

In order to gain some idea of the micro-organisms present in all cases the throat swabs and sputum results had to be combined, as sputum could only be obtained from some of the patients. This combination varied only slightly from the two separate returns. (Table III.)

The examination showed a very mixed and fairly constant flora in all cases. The chief micro-organisms present were streptococcus in 80, pneumococcus in 66, *M. catarrhalis* in 72, staphylococcus in 54, *B. influenzæ* in 46, *B. septus* in 20, pneumobacillus in 16, and meningococcus in 8 per cent. of the cases. The percentages were taken from the cultures and not from the direct smears. (Table II.)

These micro-organisms merit a more detailed description. We were unable in a routine laboratory to put the various organisms through a full series of tests, but had to confine ourselves to the standards stated below.

Streptococcus.—The streptococci present were for the most part diplo-streptococci in short or long chains. They were usually Gram-positive, although at times some units of the chains were Gram-negative. Growth on agar was slow at room temperature. Acid was produced in glucose, lactose, saccharose, and maltose. Mannite, dulcite, and inulin were unchanged. Litmus milk was rendered slightly acid with the formation of clot in most cases. The hæmolytic action of these organisms varied. Briefly, the *longus* type hæmolysed strongly, whereas the *brevis* type produced little or no hæmolysis, and the colonies had a greenish colour. Some of the *brevis* type caused distinct hæmolysis. We therefore divided the *streptococci* into *hæmolyticus* and *non-hæmolyticus*, depending on the degree of hæmolysis rather than on the actual length of the coccal chains. *Streptococcus hæmolyticus* was present in 46 per cent., *non-hæmolyticus* in 34 per cent. of the cases; from the remaining 20 per cent. streptococci could not be obtained. Streptococci were the predominant organisms in 30 per cent. of the cases.

Pneumococcus.—Difficulty was experienced in classifying certain of the Gram-positive diplococci found. Some were distinctly lanceolate in direct smears, while others were rounded. In cultures the varieties of form and chain formation rendered the task more difficult. As in the case of the streptococci, the Gram staining was a little variable at times. In some instances inulin was fermented; in others acid production was absent in this sugar. Hæmolysis was even produced by some of these pneumococci. The presence of a capsule was the deciding element in these cases. Probably some of the so-called pneumococci were really streptococci or the *Diplococcus epidemicus* of Bernhardt,[3] but in the absence of animal inoculation in all cases the returns had to be made as stated above. Pneumococci predominated in 26 per cent. of the cases.

Micrococcus catarrhalis.—Under this head are grouped all the Gram-negative diplococci, most of which grew on agar at 20° C., but did not produce any acid formation in glucose, lactose, saccharose, mannite, maltose, or inulin. In 34 per cent. of the cases *M. catarrhalis* was the predominant germ. These organisms were very similar to those isolated so frequently in the previous epidemic.[1]

B. influenzæ.—Minute bacilli or cocco-bacilli which failed to grow on ordinary agar at 37° C. and would not ferment either glucose, lactose, saccharose, mannite, maltose, or dulcite. These Pfeiffer-like bacilli were found in many of the cases, usually in small numbers, but in one case it was the predominant micro-organism.

Staphylococcus.—This was the predominant organism in 8 per cent. of the cases. Both varieties, *aureus* and *albus*, were present, most frequently the former. (See Table II.)

Meningococcus.—From the posterior nares of four cases meningococci were isolated. Two of these cases developed typical cerebro-spinal fever, two failed to show meningeal signs and were apparently carriers.

POST-MORTEM EXAMINATIONS.

Of the fifty cases dealt with in this paper there were 7 deaths, giving a case mortality of 14 per cent. The average age of the patients treated was 25, that of those who died 23, the youngest and oldest of this series being 19 and 29 years of age respectively. The day of disease on which death took place varied from the fifth to the fourteenth

Post-mortem examinations were performed on only five cases. Broadly speaking, the pathological findings were more marked in those who died later in the course of the disease. Beyond this we cannot generalise from so small a number of cases. A summary of the main points is given, as it may be of value for statistical purposes.

Synopsis of Post-Mortem Findings.

Case 12.—Trachea: Acute congestion. Small white fibrinous patches. Bronchi: Acute congestion. Submucosal hæmorrhages. Lungs: Both congested and œdematous. Pleuræ: Blood-stained exudate (left, 30 c.cm., right, 50 c.cm.) Adhesions at base, recent in left. Petechial hæmorrhages. Pericardium: Normal. Heart: Slight dilatation right heart, pallor cardiac muscle. Sub-endocardial injection. Aorta: Marked sub-intimal injection. Bronchial lymph glands: Normal. Peritoneum: Few petechial hæmorrhages. Stomach and intestines: Submucosal hæmorrhages. Liver: Slightly fatty. Spleen: Slightly enlarged, congested, pulpy. Kidneys: Congested. Brain and meninges: Congested. Cerebro-spinal fluid: Normal.

B. influenzæ isolated from bronchi and lungs, pneumococcus from lung; streptococcus from lung and bronchi, spleen, pleuritic fluid.

Case 39.—Trachea: Acute congestion; small white fibrinous patches. Bronchi: Acute congestion. Lungs: Congested and œdematous. Pleuræ: Recent adhesions left apex and base. Slight petechial hæmorrhages (both). Pericardium: Normal. Heart: Dilatation right heart. Muscle pale. Aorta: Normal. Bronchial lymph glands: Normal. Peritoneum: Petechial hæmorrhages distinct. Stomach and intestines: Normal. Liver: Slightly fatty. Spleen: Slightly enlarged, congested, pulpy. Kidneys: Congested. Brain and meninges: Normal. C.S. fluid: Normal.

Pneumococcus isolated from lungs and bronchi; streptococcus from lungs and bronchi; *Staphylococcus aureus* from lungs and bronchi; pneumobacillus from lung.

Case 19.—Trachea and bronchi: Acute congestion. Lungs: Left—Lobes adherent. Lung collapsed. Purulent bronchitis lower lobe. Right—Basal congestion. Pleuræ: Left—500 c.cm. turbid fluid (exudate). Fibrinous exudate over lower part lung and diaphragm. Right—A few petechial hæmorrhages. Pericardium: Normal. Heart: Slight dilatation right heart. Pallor of cardiac muscle. Sub-endocardial injection. Aorta: Normal. Bronchial lymph glands: Enlarged and congested. Peritoneum: Fibro-purulent peritonitis. Petechial hæmorrhage. Stomach and intestines: Fibrinous adhesions. Liver: Slightly fatty. Spleen: Slightly enlarged, congested, pulpy. Kidneys: Toxic nephritis. Brain and meninges: Normal. C.S. fluid: Normal.

Streptococcus isolated from lungs, heart's blood, spleen, peritoneal fluid, pleuritic fluid.

Case 5.—Trachea: Acute congestion. Small, white, fibrinous patches. Bronchi: Acute congestion. Coated with fibrinous lymph. Filled with pus. Lungs: Left—Lobes adherent. Lung collapsed. Purulent bronchopneumonia. Right—Lobes slightly adherent. Marked congestion. Pleuræ: Empyema (left). Petechial hæmorrhages (both). Pericardium: Sero-fibrinous pericarditis. Petechial hæmorrhages. Heart: Dilatation right heart. Pallor of cardiac muscle. Sub-endocardial injection marked. Aorta: Marked sub-intimal injection. Bronchial lymph glands: Enlarged and congested. Peritoneum: Petechial hæmorrhages, especially over liver and diaphragm. Stomach and intestines: Submucosal hæmorrhages. Liver: Slightly fatty. Spleen: Slightly enlarged, congested, pulpy. Kidneys: Toxic nephritis. Brain and meninges: Congested. C.S. fluid: Normal.

Pneumococcus isolated from lungs, bronchi, pericardial sac, pleuritic fluid; streptococcus from lung, bronchi, heart's blood, pleuritic fluid; *Staphylococcus aureus* from lungs and bronchi, pleuritic fluid; pneum bacillus from lung.

Case 30.—Trachea: Acute congestion. Small white fibrinous patches. Bronchi: Acute congestion. Fibrinous patches. Submucosal hæmorrhages. Lungs: Lobar pneumonia of left lower lobe, and of right lower and mid lobes. Pleuræ: Blood-stained fluid 400 c.cm. left, 200 c.cm. right. Recent adhesions left base. Adhesions posteriorly right pleura. Petechial hæmorrhages (both). Pericardium: Normal. Heart: Dilatation right heart. Pallor cardiac muscle, slight sub-endocardial injection. Aorta: Marked sub-intimal injection. Bronchial lymph glands: Enlarged and congested. Peritoneum: Petechial hæmorrhages. Stomach and intestines: Normal. Liver: Slightly fatty. Spleen: Normal. Kidneys: Cloudy swelling and fatty changes. Brain and meninges: Normal. C.S. fluid: Normal.

Pneumococcus isolated from lungs, pleuritic fluid; streptococcus from lungs and bronchi, pleuritic fluid.

Summary of Post-Mortem Findings.

Pharynx and larynx.—Showed only slight congestion.

Trachea.—In the five cases there was marked acute congestion of the mucosa; thin, whitish, fibrinous patches here and there. These changes were more marked in the lower part. In two of the cases greenish-yellow pus filled the lumen of the tube.

Thorax.—Bronchi were markedly congested in all cases, the mucosa being very bright red in colour. Pus filled them in two cases as mentioned under trachea.

Lungs.—In the two cases which died on the fifth day there were only marked congestion and œdema of both lungs. One case presented the picture of purulent bronchitis; one of purulent broncho-pneumonia. In both cases there was collapse of the left lung. In the remaining case there was double lobar pneumonia (early grey hepatisation).

Pleuræ.—In all cases there were numerous small petechial hæmorrhages, especially under the visceral layer at the bases of the lungs. A fibrinous exudate loosely bound the bases of the lungs of one case to the parietal wall, while in two other cases both pleural sacs contained about a pint of blood-stained inflammatory exudate. In two further cases unilateral empyema was present—in both instances the left pleural sac was involved. Several pints of sero-pus almost filled the sac in one of these cases.

Pericardium.—Sero-fibrinous pericarditis was present in one of the cases with empyema. Petechial hæmorrhages studded the epicardium in this case. Fibrinous patches covered the surface of the right ventricle, especially towards its base. In the other four cases the pericardium was normal.

Heart.—In all cases there was more or less dilatation of the right heart, ante-mortem clot in right auricle and ventricle, and pallor of the cardiac muscle. In all except one case there was marked injection of the endocardium, especially in the valvular regions extending into the pulmonary arteries and aortic arch (aortitis).

Bronchial lymph glands were distinctly enlarged, soft, and congested in three of the cases.

Abdomen.—*Peritoneum.*—Fibro-purulent peritonitis was found in one case and petechial hæmorrhages in all, best marked over the liver, especially the diaphragmatic surface.

Liver.—Early fatty changes throughout.

Spleen.—Somewhat enlarged, congested, soft and pulpy, except in one case where there was no change.

Kidneys.—In one, slight fatty changes; two showed marked congestion, and two distinct toxic nephritis.

Stomach and intestines.—Submucosal hæmorrhages in two cases.

Brain.—Distinct congestion of meninges and grey matter of the cortex in two cases. Ventricular fluid normal in all.

The bacteriological examination of materials taken at the post-mortem showed: *B. influenzæ* in the bronchial discharges and lungs in one case only. Pneumococci were present in the bronchial discharges, lung smears, and pleuritic fluid of these cases; in every instance accompanied by streptococci, and in two cases by *Staphylococcus aureus*. On one occasion pneumococci were isolated from the pericardial sac.

Streptococci were present in the bronchi and lungs of all five cases, in the pleuritic fluid of four, heart's blood and spleen of three, and peritoneal fluid of one. The cocci conformed to the *hæmolyticus* type in all except one case. Pneumobacilli were isolated from the lungs of two cases. *Staphylococcus aureus* in the bronchi and lungs of two cases.

THE URINE.

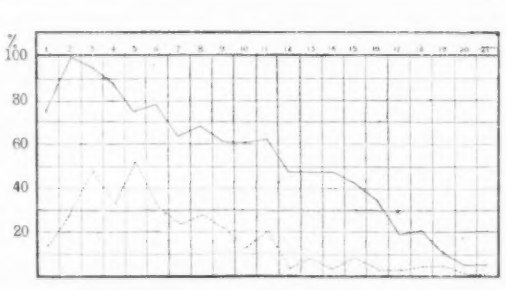
The urines from 50 cases were subjected to a thorough routine examination. The outstanding features were the presence of albumin and renal casts in many, acetone and excess of urates in some, especially at the height of fever in the pneumonic cases. The acetone disappeared with the fever.

As in the July epidemic,[1] albumin was present in a high percentage of cases—on the second day of disease 100 per cent. Casts and renal epithelium undergoing granular degeneration were present in 50 per cent. on the third to fifth day. Granular casts and renal cells were the commonest. Hyaline casts were frequently present, and in some of the more severe cases epithelial and even blood casts were found.

On the whole, the kidney changes were greater in the present outbreak (see Table IV. and Graph); the Esbach

TABLE IV.—*Percentage of Cases of "Influenza" with Albumin and Casts in the Urine.*

Day of disease.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
No. of cases examined	8	18	27	32	32	40	37	32	26	23	24	23	23	23	23	20	21	19	20	17	17
Percentage with albumin	75	100	96	87	75	77	65	69	62	61	62	48	48	48	43	35	19	21	10	6	6
Percentage with casts...	12	27	48	34	53	32	24	28	23	13	21	4	8	4	8	4	5	5	5	0	0



Graph showing percentage of cases of "influenza" with albumin (continuous line) and casts (dotted line) in the urine on successive days of the disease.

reading on the third to fourth day was often 2 to 3 parts per 1000. These higher readings were seen for the most part only in cases showing definite chest signs. Moreover, the albumin continued to be present over a longer period, in some instances not clearing away until the twenty-first day of disease. In many cases the albumin gradually diminished in amount from the second day of disease, disappearing on the seventh, eighth, and ninth days, only to return when the patient was given an increase in diet or allowed out of bed.

In those cases confined to bed for a fortnight a slight "dietetic" rise was apparent about the ninth day; this soon disappeared, reappearing quickly when the patient was allowed up on the fourteenth day. Certainly the amount was small, but its significance is obvious in that we have seen patients return to duty only to relapse, with distinct albuminuria and œdema of the eyelids. This point we wish to emphasise on account of men who have mild attacks of influenza and are discharged from hospital at the end of a week or so. They return to duty, often up the line, where they run the risk of developing nephritis. Several such cases have come to our notice. It is of the utmost importance that all influenza cases should be free from exposure to the elements and hard work for at least three weeks after the acute symptoms subside, otherwise in the long run the health and efficiency of the fighting forces is diminished.

THE LEUCOCYTE COUNT.

Daily total and differential leucocyte counts were done on 12 cases over a period varying from 5 to 21 days. Individual counts were made on 20 cases. The daily counts were always taken at the same hour of day (all were collected between 10 and 11.30 A.M.), with the same instruments, and by the same observer in each case. The total white counts were mounted three times and the leucocytes on the 256 squares of a Thoma-Zeiss hæmocytometer slide counted with each mounting. This routine eliminated as far as possible errors of technique.

A critical survey of the results obtained show three distinct types of leucocytic curves in the present "influenza" epidemic, viz.:—(1) Influenza uncomplicated; (2) pneumonic form of "influenza"; (3) lethargic form of "influenza."

1. *The influenza type* is depicted in Charts 1 and 1A.

The salient features are a total leucocyte count a little below normal in the early days of the disease, and a leucocytosis of moderate degree (10,000 to 15,000 per c.mm.) sets in from the fifth to seventh day, this being most marked when the patient gets out of bed and goes about (20,000 per c.mm.). The absolute number of lymphocytes and neutrophil polymorphs (neutrophils) are slightly below the normal on the first two days of the illness; they soon recover their normal proportions, the lymphocytes recovering first. There is from now, as long as the fever lasts, a slight relative and absolute lymphocytosis, followed by a neutrophilia when convalescence sets in. The eosinophils and basophils are much decreased or absent during the pyrexia, but soon reappear when the fever subsides. (Table V.)

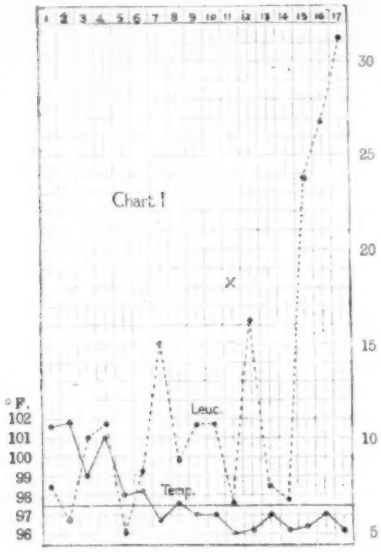
2. *The pneumonic type* shows a striking contrast to the above.

Distinct leucocytosis is present from the onset, and the total white count never falls below normal, unless death occurs, when either a leucocytosis or leucopenia may supervene. The leucocytosis varies from 15,000 to 30,000 per c.mm. (See Chart 2 and Table VI.) Often the highest counts are found after the temperature has fallen to and remained normal. This leucocytosis gradually lessens during convalescence unless complications arise.

There is a relative and absolute increase in the neutrophils in the first few days of the fever, followed the next few days by a fall to normal of the number of neutrophils per c.mm., while the lymphocytes are subnormal. After the fifth day relative and absolute neutrophilia again becomes marked, and although the total number of lymphocytes increases it only reaches the normal line. Eosinophils and basophils disappear during the fever and reappear when the temperature returns to normal. If complications ensue the eosinophils disappear again. (Table VI.)

3. *The lethargic form* is quite distinct from either type 1 or 2. An absolute decrease in leucocytes (2000 to 3000 per c.mm.) is present from the first. This leucopenia lasts 7 to 12 days, at times remaining at a more or less constant level, at others slowly rising until convalescence sets in. The onset of convalescence is marked by a distinct increase in the total number of white blood corpuscles (10,000 to 15,000 per c.mm.) (Chart 3.) In those cases where death takes place the leucopenia becomes more and more pronounced as the end draws near. (Chart 4.)

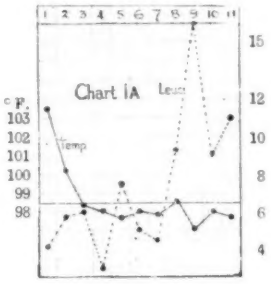
All the normal varieties of white corpuscles show an absolute decrease in their numbers during this leucopenia. The neutrophils, eosinophils, and basophils are most affected, the lymphocytes less so. With convalescence relative and absolute neutrophilia gradually establishes itself. (Table VII.)



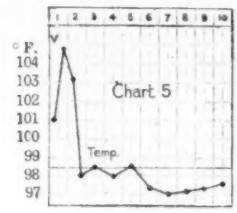
Leucocyte Count, Type I. Note the relatively low count during the febrile period, followed on the seventh day and onwards by a distinct leucocytosis. At × the patient was up for the first time.

EXPLANATION OF CHARTS.

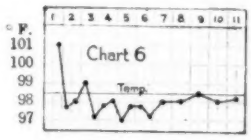
In all the charts the continuous line gives the temperature (key on left-hand margin); the interrupted line the leucocyte count in thousands per c.mm. (key on right-hand margin). The numbers at the head of the chart refer to the day of disease.



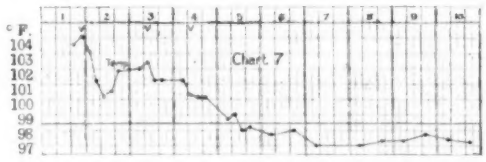
Note the leucopenia during febrile period, followed by a leucocytosis on the eighth day. This case was from the July epidemic.



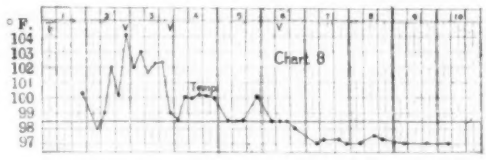
At V 0·5 c.cm. of prophylactic vaccine was given. Note the high initial temperature and the rapid return to normal.



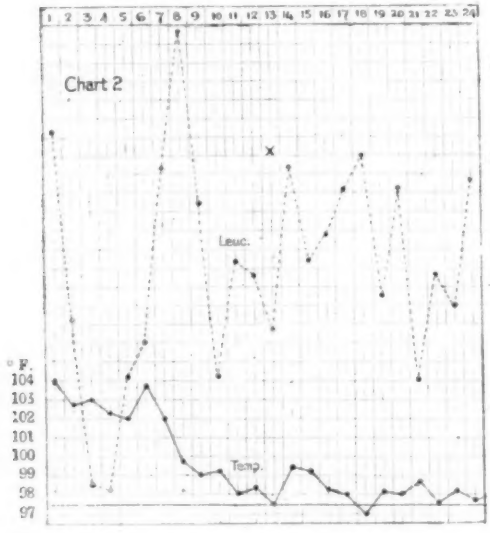
This case received 0·5 c.cm. of the prophylactic vaccine five days previous to the onset of influenza. Note the short course.



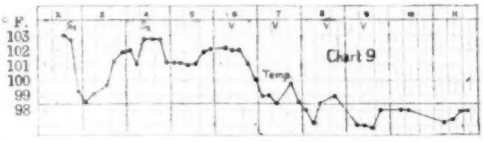
This case was admitted with definite pulmonary symptoms. Vaccine treatment (V, V, V, dose 1 c.cm.); short course; uninterrupted recovery.



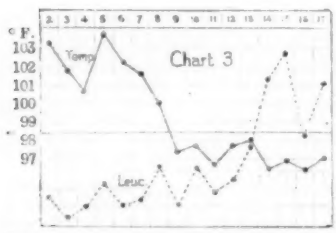
At V, the second day of disease, when the temperature reached 104·2° F., the first inoculation of 1 c.cm. curative vaccine was given. The dose was repeated on the third and sixth days. General improvement set in after vaccine treatment was started.



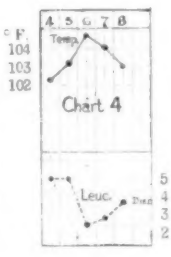
Leucocyte Count, Type II. Note the distinct leucocytosis throughout. At × onset of empyema.



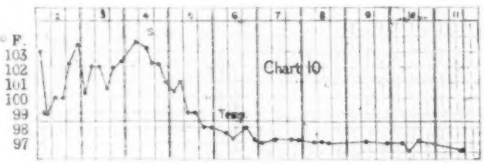
At S_1 20 c.cm. of antistreptococcal serum were given subcutaneously; at S_2 another 10 c.cm. Note the fall in temperature after the serum injections. At V, V, V, V daily inoculations of curative influenza vaccine were given to hasten resolution.



Leucocyte Count, Type III. Recovery. Note the leucopenia lasting 13 days, followed by a slight leucocytosis.



Leucocyte Count, Type III. Continued leucopenia up to the time of death.



At S, the fourth day of disease, 20 c.cm. of antistreptococcal serum were given subcutaneously.

Charts 9 and 10 may be compared with Chart 11, shown on the opposite page. This chart illustrates the failure of serum given after the fifth day.

TABULAR STATEMENT OF THE LEUCOCYTE COUNTS.

TABLE V. (*Case 23*).
Blood taken 11.30 A.M. daily.

Day of disease.	Temperature °F.	In 1000's.			Differential count per cent.							%	
		Total white cells.	Small lymphocytes.	Neutrophils.	Small lymphocytes.	Large lymphocytes.	Hyalines.	Transitionals.	Neutrophils.	Eosinophils.	Basophils.	Leucoblasts.	Non-granular.	Granular.
1	102·6	7·5	1·2	4·8	16	5	1	11	65	1	—	—	22	77
2	102·8	5·6	1·0	3·5	18	6	3¼	8½	64	—	¼	—	27	72
3	100	10·0	4·0	4·4	40	5½	1	8½	44	—	—	—	47	53
4	100·2	10·6	3·0	5·6	28	8¾	1½	8½	53	—	¼	—	38	61
5	99	5·0	2·2	1·6	44	8	1	12	32	1	2	—	53	47
6	99·2	8·1	1·8	5·1	22	7	—	6½	63	½	½	—	29	71
7	97·6	15·0	4·4	8·2	29	4¾	—	8¾	55	1¾	¼	—	34	65
8	98·5	8·7	2·8	4·6	32	5	—	7¾	53	¾	½	—	37	62
9	98	10·6	3·3	5·4	32	8	1¼	5¼	51	2¾	¼	—	41	59
10	98	10·6	3·3	6·2	31	3½	1	5½	58	¼	—	—	35	64
11*	97	6·5	1·7	3·5	27	6	3	5¼	54	4¼	¾	¼	35	64
12	97·2	16·2	5·9	7·6	36	3¼	2	8	47	2½	1	—	41	58
13	98	7·5	2·5	4·0	34	3	1	5	54	1½	1½	—	38	62
14†	97·2	6·8	2·9	3·1	42	3	2	4	45	2½	1	—	47	52
15	97·4	23·7	6·3	12·8	28	4½	1¼	12	54	1½	½	—	32	67
16	98	26·8	6·2	14·6	23	5½	1¼	11	54	3	1¼	—	30	70
17	97·2	31·2	4·8	17·2	15	7¼	1½	18	55	2	¼	—	24	75

* Up for first time. † Outdoors first time.

TABLE VI. (*Case 11*).
Blood taken at 11 A.M. daily.

Day of disease.	Temperature °F.	In 1000's.			Differential count per cent.							%	
		Total white cells.	Small lymphocytes.	Neutrophils.	Small lymphocytes. Large lymphocytes.	Hyalines.	Transitionals.	Neutrophils.	Eosinophils.	Basophils.	Leucoblasts.	Non-granular.	Granular.
1	105	26·2	1·3	22·3	5	2	1	7½	85	—	—	8	92
2	103·8	16·2	1·4	14·0	9	1½	1½	2	86	—	—	12	88
3	104	7·5	·5	6·5	7½	2½	—	2½	87	—	—	10	90
4	103·4	7·2	·5	6·0	7½	2	¼	6¼	84	—	—	9¾	90
5	103	13·1	·8	11·9	6½	1	—	2	90	—	—	7½	92
6	104·6	15·0	·8	13·6	5¼	2	—	2¼	90	—	—	7¼	92
7	103	24·4	1·1	22·0	4¾	2¼	¼	3½	89	—	—	7¼	92
8	100·6	32·0	3·6	26·1	11	2	—	4¼	82	½	—	13	86
9	100	22·5	1·5	19·2	7	3	—	4¼	86	—	—	10	90
10	100·2	13·1	1·0	11·5	8	1	¼	2¾	86	—	¼	9¼	90
11	99	19·4	1·4	16·1	7¼	5¼	—	3¼	83	¼	¾	12	87
12	99·4	18·7	1·5	15·6	8¼	2¼	¼	4¾	83	¼	¾	10	89
13*	98·4	15·6	1·6	13·1	10	1¼	1	3¼	84	¼	¼	12	87
14	100·5	24·4	2·3	21·4	9¾	1¼	½	½	88	—	¼	11	88
15	100·2	19·4	1·7	16·5	9	2	1	2¾	85	—	—	12	88
16	99·2	20·6	1·8	17·0	8¾	3½	1½	3¾	82	—	¼	13	86
17	99	23·1	2·5	19·1	11	¾	1	4¾	83	—	—	12	87
18	98	25·0	1·5	21·5	6	3¼	½	3¼	86	—	¾	9¾	90
19	99·2	17·5	2·4	14·2	14	½	¾	3¼	81	¼	¼	15	85
20	99	23·1	2·8	19·0	12	1	½	3½	82	¼	½	13	86
21	99·6	13·0	·8	11·0	6½	3¾	½	3¼	85	—	1	10	89
22	98·5	18·8	1·6	15·0	8¾	4¼	½	5½	80	—	½	13	86
23	99·2	17·0	1·8	13·1	11	4¾	¾	6	77	—	¼	16	83
24	98·6	24·0	1·5	18·4	6½	5¾	1	8½	78	½	—	13	86
25	99	42·5	5·6	31·8	13	¼	¾	11	75	—	¼	14	85
26	98·5	17·5	3·3	12·5	19	1¼	1¾	3¾	72	1½	1¼	21	78
27	98·5	20·0	2·0	15·8	10	1	¾	8¼	79	¾	½	11	88

* Empyema developing.

TABLE VII. (*Case 48*).
Blood taken 10 A.M. daily.

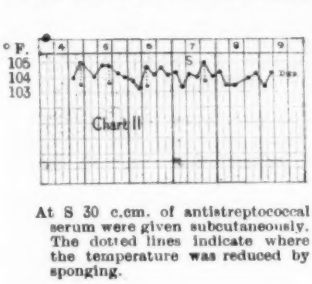
2	103·1	3·1	1·1	1·3	37	9	3	7	41	—	3	—	48	51
3	101·8	2·2	·9	1·0	42	6	1½	2½	46	½	½	—	50	50
4	100·6	2·5	1·1	1·1	45	7½	½	2	44	—	½	—	53	47
5	103·6	3·8	1·3	2·0	35	6	1	3	54	—	½	½	42	58
6	102·2	2·5	·9	1·3	38	5	4	2	50	—	½	—	47	53
7	101·6	2·8	1·8	·6	63	7½	—	6½	23	—	—	—	70	29
8	100	4·7	2·2	1·8	48	7	—	4	39	2	—	—	55	45
9	97·2	2·5	·8	1·2	34	10	4	2	48	2	—	—	48	52
10	97·8	4·7	2·0	1·4	42	17	3½	8	30	—	—	—	62	37
11	96·7	3·1	1·4	1·3	45	5½	—	6¼	41	2¼	—	—	50	49
12	97·8	4·0	1·4	2·0	35	9¾	¾	2¼	46	4½	½	—	46	54
13	98	5·6	1·4	3·0	25	7	2	8	53	4½	—	—	34	66
14	96·5	9·4	2·3	6·0	24	5	¼	5½	61	2¾	—	—	29	70
15	96·8	10·8	4·0	5·3	36	6	—	4	50	3	½	—	42	57
16	96·5	6·2	2·0	3·5	33	5½	1¼	2¾	55	1¾	½	—	39	60
17	97	9·0	2·7	5·4	30	5¼	¾	4¾	59	—	—	¼	35	64

TABLE VIII. (*Case 39*).
Blood taken 10.15 A.M. daily.
Death on ninth day.

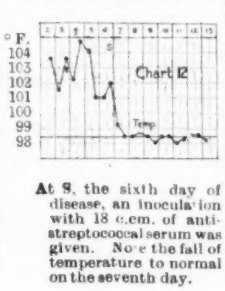
4	102·2	5·0	1·1	3·2	21	5½	3	4½	65	½	¼	—	30	70
5	103·2	5·0	1·8	2·8	36	3¾	1	2¾	56	—	¼	—	41	59
6	104·6	2·5	·8	1·5	33	5½	¾	1¾	59	—	—	—	39	60
7	104	2·8	1·1	1·5	38	3	1	3	54	—	—	¼	42	57
8	103	4·0	1·1	2·3	30	4	1	½	62	—	—	1¾	35	64

What the exact significance of these different leucocyte curves is it is difficult to say. The variation may be due to differences in the infecting agents, or the defensive and recuperative powers of the individual. Bacillary infections are frequently associated with a leucopenia, micrococcal infections with leucocytosis. We are inclined to the view that one organism—perhaps *B. influenzæ*—is responsible for Type 1, and when the infection is coccal there is either a good reaction on the part of the body causing a leucocytosis to develop, or the defensive powers are low and a leucopenia results. Generally speaking, a leucocytosis is a good sign, a persistent leucopenia is serious. In the latter case it is advised that a dose of mixed influenza vaccine (curative) be given to try to produce a leucocytic reaction. Serum is of no avail, for with it we have found a leucopenia.[4]

One other point worthy of mention is the disappearance of the eosinophils, not only when there is actual fever, but also with approaching fever or sepsis with low fever. Their return is of good omen. We have repeatedly noticed them disappear with the febrile stage of pneumonia, reappearing as defervescence takes place. In cases where an empyema supervened the eosinophils were absent from the peripheral blood prior to the condition being diagnosed clinically. (Table VI.)



At S 30 c.cm. of antistreptococcal serum were given subcutaneously. The dotted lines indicate where the temperature was reduced by sponging.



At S, the sixth day of disease, an inoculation with 18 c.cm. of antistreptococcal serum was given. Note the fall of temperature to normal on the seventh day.

VACCINE TREATMENT.

The vaccine prepared by us was made from micro-organisms isolated from severe cases in the present epidemic. Most of the streptococci and pneumococci were obtained from post-mortem examinations. The vaccine was used (1) as a prophylactic and (2) as a curative. It consisted of the following micro-organisms:—

Streptococcus (a mixture of short and long chain streptococci from six severe cases)	50 millions each per c.cm.
Pneumococcus (a mixture of pneumococci from six cases)	
Micrococcus catarrhalis (a mixture from two cases) ...	
Bacillus influenzæ (a mixture from two cases)	20 millions each per c.cm.
Meningococcus (a mixture from two cases)	

First dose = ½ c.cm. Second dose = 1 c.cm. (seven to ten days later).
The curative dose was made up a tenth of this strength, and given daily in some cases, in others every second day.

Since the preparation and use of this vaccine we note that the conference held at the War Office on Oct. 14th,

1918,[5] recommended that the vaccine for influenza should consist only of *B. influenzæ*, pneumococcus, and streptococcus. We still continue to incorporate the *Micrococcus catarrhalis* on account of its common occurrence (72 per cent. in this epidemic); its frequency and advisability as an ingredient of an influenza vaccine has been commented on by others.[6] On account of the cases of cerebro-spinal meningitis accompanying influenza, the meningococcus was added to the vaccine. The present disease apparently varies according to the number and virulence of one or more of these organisms, and so the "blunderbuss" method of treatment is forced upon us.

Prophylactic Vaccine.

This has been administered to several hundred people, the local and general reaction being slight, passing off completely in 24 hours, although some cases complained of local tenderness for 48 to 72 hours, but on inspection the cause was usually found to be injury to some small vein at the time of inoculation. There is little or no fever. A few cases have complained of some depression after the second inoculation. All the persons inoculated have continued their daily duties without experiencing any inconvenience.

We confine our attention in this report to the inoculated and uninoculated cases in one institution.

The total number of persons in the institution was 305. Of these, 156 were inoculated and 149 uninoculated.

The case incidence of the inoculated was 8 in 156 (i.e., 5 per cent.); amongst the uninoculated 18 in 149 (i.e., 12 per cent.).

All the inoculated persons who developed influenza had only mild attacks. Four of the eight attacked had slight fever and malaise at the time of inoculation and definite fever (102° to 104·8°) within 24 hours. This febrile period terminated in 48 hours, in contra-distinction to the seven-day course of the uninoculated. (See Chart 5.) The associated albuminuria disappeared within five days, convalescence being well established by the end of a week.

The protective influence of the vaccine is even more striking if the incubation period is taken as 40 hours.[7] The above four cases should then not be counted, thus reducing the disease incidence amongst the inoculated to 2·5 per cent. Of the remaining cases two developed the disease five days after the first inoculation, the other two four days after receiving a second injection. In each of these four cases the fever was slight (100°–101·5° F.), the temperature returned to, and remained, normal after 24 hours. (Chart 6.) There were no pulmonary symptoms in any of the inoculated cases.

The 18 uninoculated cases who fell victims to the disease had typical attacks with a five to seven day course in the milder, and a more prolonged one in the complicated cases. Pulmonary involvement was distinct in seven of the cases.

It is not claimed that the above vaccine is an absolute preventive, but we certainly think it will abolish or considerably modify the toxic type of the disease. The argument that vaccine treatment during the epidemic renders people more susceptible to infection carries little weight when the short and comparatively mild course of the disease in the inoculated is considered.

Curative Vaccine.

The dosage used by us in all cases was 1 c.cm. containing:

Streptococcus	5 millions.	Meningococcus ...	2 millions.
Pneumococcus	5 ,,	*B. influenzæ*	2 ,,
M. catarrhalis	5 ,,		

The first injection was given as soon after admission as possible, and repeated daily until the temperature fell to normal.

The vaccine was used alone in cases giving a temperature of 103·5° F. or under; for cases with higher temperatures 20 c.cm. of polyvalent antistreptococcus serum was given subcutaneously, thereafter 10 c.cm. being administered daily for three or four days. At times vaccine treatment was combined with the serum. (See Charts 7 and 8.)

In no instance had the vaccine any ill-effect, but, on the contrary, several cases cleared up rapidly, the fever passing off in three or four days, at times sooner, even when the initial temperature was high and the patient obviously ill. Furthermore, the albuminuria and renal casts disappeared more rapidly in the cases treated with vaccine than in those treated with drugs only.

In a few cases of the pulmonary type, when there was no sign of abatement of the disease on the seventh day, 1 c.cm. of the vaccine was injected daily, the result being a fall of the temperature by lysis. This, of course, may have been a coincidence, but in two cases aspirin and various other drugs failed to affect the fever, whereas the temperature gradually fell about 24 hours after the vaccine treatment started.

Personally, we are convinced that the vaccine does no harm, but frequently promotes a quick recovery. Such vaccines should be administered as early in the disease as possible. The short acute course of two cases inoculated the first day of the disease with a full prophylactic dose suggests that all cases seen early may have their course cut short by a large dose of the vaccine before toxæmia has time to set in.

SERUM-THERAPY.

Briefly, cases treated early in the disease have a far greater chance of recovery than those treated late, as a glance at Table IX. shows. All the cases were severe. Of those injected with serum before the sixth day all recovered—i.e., six out of six; while of those injected after that day—six all told—four died (i.e., 66 per cent.).

TABLE IX.—*Day of Disease of First Serum Injection.*

Case.	Day.	Result.	Case.	Day.	Result.	Case	Day	Result.
22	2	Recovery.	48	5	Recovery.	26	8	Died.
19	4	,,	16	5	,,	34	10	Recovery.
38	4	,,	2	7	,,	5	10	Died.
33	5	,,	27	7	Died.	21	13	,,

In Chart 9 the effect of the administration of serum early in the disease is well shown. This patient had definite pulmonary signs, but from the third day there was a distinct general improvement in the case; recovery from the seventh day was uninterrupted. Curative vaccine was given daily on the sixth to ninth day inclusive. Chart 10 shows the effect of the serum given on the fourth day of the disease. These charts should be compared with No. 11, illustrating the failure of serum given after the fifth day.

It is apparently necessary to emphasise the importance of not laying too much stress on vaccine or serum treatment delayed until the sixth or seventh day of disease, as we have seen much credit given to most forms of treatment solely from the results as depicted in Chart 12. In such cases the sudden fall in the temperature and general improvement of the patient is most likely due to the natural termination of the pneumonia on those days.

These observations on antistreptococcus serum apply solely to that prepared by Messrs. Burroughs, Wellcome, and Co.

SUMMARY.

1. The results of blood cultures show that there is septicæmia in some of the cases. Most of these have a fatal issue. The figures at our disposal are insufficient to make any definite statement as to whether this septicæmia is present early in the disease or only as a late symptom. That it is a late symptom is borne out by the fact that streptococci were isolated from the heart's blood after death in cases where the blood-culture result was negative early in the disease.

2. The causal micro-organism of the septicæmia is not the same in all cases.

3. The examination of sputa and posterior nasal swabs shows a *mixed* and fairly constant flora. Such organisms as streptococcus, pneumococcus, *Micrococcus catarrhalis*, and *B. influenzæ* are present in a high percentage of cases; in all instances over 66 per cent., except in that of *B. influenzæ* (46 per cent.).

4. The predominating organism varies, being: *Micrococcus catarrhalis* in 34 per cent., streptococcus in 30 per cent., pneumococcus in 26 per cent., *Staphylococcus aureus* in 8 per cent., and *B. influenzæ* in 2 per cent. of the cases. It should be noted that in only one of this series of cases was Pfeiffer's bacillus found to be the predominating organism.

5. Post-mortem examinations show lung lesions in all cases, varying from congestion and œdema to pneumonia and pus formation. Invariably the picture was that of a marked toxæmia, e.g., congestion and petechial hæmorrhages of serous and mucous membranes, cloudy swelling and fatty changes of liver, kidney, and cardiac muscle, and in two an acute nephritis.

The micro-organisms—isolated from lung, pleural and peritoneal lesions, blood and spleen—coincide closely with the mixed flora obtained before death. Only in one case was the *B. influenzæ* found in the lesions.

6. Isolation of diplostreptococci from the heart's blood and spleen post mortem supports the view that a true septicæmia is present.

7. Albuminuria is a constant feature. Casts are present in 50 per cent. of the cases. That there is a definite

nephritis in some cases is clear from the appearance of epithelial and blood casts, and fully substantiated by the post-mortem findings.

8. There is sufficient evidence in all cases that the renal condition warrants especial care during convalescence.

9. The daily leucocyte counts show that all cases do not conform to one type. Broadly speaking, a leucopenia, if continued, is of bad, a leucocytosis of good, prognostic import. A marked leucocytosis after the eighth or ninth day, especially if the eosinophils are much decreased or absent, strongly suggests complications. Incomplete recoveries and the oncoming of a relapse can often be diagnosed from the blood picture, even when the clinical signs are slight or absent.

10. Prophylactic vaccination on two, preferably on three, occasions with a weekly interval between each inoculation is without risk, increases the immunity of the individual, and prevents the onset of pulmonary complications. Should the inoculated develop influenza the course of the disease is invariably mild.

11. As regards treatment, we recommend that: (1) In very early cases a full dose of prophylactic vaccine should be administered. No further doses to be given at least for several days. (2) Cases seen on the first day, or later, provided the temperature is not above 104° F. or the patient markedly toxic, should be given 1 c.cm. of the curative vaccine daily until temperature falls to normal, unless symptoms become worse. (3) Those cases which show high pyrexia or toxic condition from the start should be treated with polyvalent antistreptococcus serum, 20 c.cm. should be administered subcutaneously *as soon as possible*, and followed by daily injections of 10 c.cm. for three or four days. With this treatment calcium lactate, gr. 5, should be given daily for 7 to 10 days to ward off serum sickness. Vaccine may be combined with this if required.

There is no reason why other forms of treatment should not be combined with the above.

CONCLUSIONS.

The variety of clinical types, as depicted by symptoms and leucocyte counts, the mixed bacterial flora obtained from blood cultures, sputa, throat swabs, and at post-mortem examinations, render it quite impossible to assign any one specific virus as the causal organism. The bacillus of Pfeiffer was found in 46 per cent. of the cases, and only as the predominating organism in one case out of 50. It may possibly be the primary agent, and the other micro-organisms found secondary, but we see no reason why this should be the case when such micro-organisms as the streptococcus and pneumococcus are far more frequently found in the pathological lesions in this disease.

Although there is the remote possibility of there being an underlying ultra-microscopic agent at work in lighting up the epidemic, one cannot conceive a *single* activating agent in a disease attacking its victims in such diverse ways."

In our opinion the presence of a more or less constant group of micro-organisms renders each individual the potential possessor of the specific symptoms caused by each virus. This will depend on various factors, such as the number and virulence of the micro-organisms, the resistance of the patients, and intercurrent diseases.

From the foregoing results we are forced to conclude that the malady we have been studying is not a simple but a "compound" disease.

We are greatly indebted to Lieutenant-Colonel T. S. Allan, R.A.M.C. (T.), O.C., Military Hospital, Hampstead, and Lieutenant-Colonel F. F. Muecke, R.A.F. (M.S.), O.C., R.A.F. Central Hospital, Hampstead, for permission to carry out this work, and to Major W. Byam, R.A.M.C., and Surgeon-Lieutenant O. H. Gotch, R.N., and other medical officers concerned for access to their cases. Special thanks are due to Miss Samuel, B.Sc., for her loyal assistance throughout.

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SOME OBSERVATIONS ON THE MORE SEVERE CASES OF INFLUENZA OCCURRING DURING THE PRESENT EPIDEMIC.

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IT is as yet too early to write a full and adequate account of the prevailing epidemic of influenza. Some time must still elapse before the clinical and pathological experience of different observers can be collated, and before the statistical results of those who have been in charge of large numbers of cases under Service conditions can be properly interpreted. But it may be well even at this stage to put on record certain observations of a general sort, with such reflections concerning them as may lead to critical analysis by others of their own experience. These observations being more or less disjointed, they are set out under certain convenient headings.

I.—*The Pyrexia.*

The temperature rises abruptly with the invasion symptoms, which are not nearly so painful in many cases as they were wont to be in former recent epidemics, and reaches 103–4–5°. In the majority of cases it remits or intermits. It also usually "responds" at the early stage to various antipyretic drugs, falling with a sweat, and rising again. If no such response occurs, assuming an adequate dose has been given, this is a bad sign; the case is likely to prove one of the more serious sort. *With this experience it is unwise to repeat the drug.* If the initial temperature rises to a high level and continues there without remission the case will probably be one of the intensely toxic kind; it may even fulminate and prove rapidly fatal. If it be a case of the lesser degree of these two conditions, the condition may in three to six days become hyperpyrexial, with dusky facies, delirium or stupor, tremor, dry tongue, shallow respirations, and a deceptively low pulse-rate in proportion to the high temperature, which may reach 106° or higher. If neither of these two very serious conditions ensues the temperature continues to remit or intermit until about the fourth to fifth day, when it may suddenly rise to a higher level and remain there, indicating some acute pulmonary event, which in the majority of instances turns out to be pneumonia. In this case the subsequent course of the pyrexia depends upon the developments in the lung (*vide* § II.). If the pulmonary event is a broncho-pneumonia, or a purulent bronchitis, or a pleurisy, the higher level of the pyrexia remains but the temperature intermits. Should no pulmonary event supervene other than the congestion common to nearly all severe cases, the temperature usually begins to fall about the fifth or sixth day, and reaches normal, by a process of lysis, about the tenth to twelfth day. In a few cases a crisis is observed, and in rather more a pseudo-crisis, followed by a recrudescence, and this recrudescence is very prone to be accompanied by an acute pulmonary complication. The pyrexia sometimes terminates rapidly with the expectoration of a large amount of bloody sputa (*vide* § III.), as if a pneumonic process "aborts." Once it is down the temperature may remain subnormal for a few days and gradually return to normal. True relapses are uncommon in the absence of gross mismanagement. A few cases show a quotidian intermitting temperature (to 99·5–101°) for several days, it may be for two or three weeks, after the main fall in the pyrexia, and the rise is sometimes in the morning and not in the evening.

The question of the existence of *apyrexial cases* of influenza is, I think, to be answered in the affirmative. Though it is scarcely possible to make a diagnosis in the absence of a raised temperature, I have met with instances of relatively severe prostration associated with pulmonary catarrh, lack of heart tone, and sweats without fever that were probably due to influenza. They have generally, but not always, been in persons over 60 years of age. In this connexion it is well to remember that typhoid fever may be apyrexial in elderly patients. There is an obvious practical point as regards treatment underlying this consideration.

II.—*The Respiratory System.*

The respiratory system is affected in a large number of ways. But it is perhaps worthy of note that the "catarrhal"

element, in so far as the mucosa of the upper air passages is concerned, seems much less in evidence during this epidemic than during former ones. Not only is this so in the course of the disease, it is seen also in the relative infrequency of catarrhal sequelæ. But certain considerations warn us not to take this fact to mean that we are not dealing with the same virus as was responsible for the epidemics of influenza in which catarrhal manifestations were very prominent: (1) The bronchiolitis which is so common a feature in many of the severe cases is essentially a catarrhal process; (2) the so-called "simple febrile" type of influenza occurring in other epidemics was a catarrhal; (3) different epidemics of well-known diseases (e.g., scarlet fever) are prone to exhibit different features, though probably due to the same virus.

The respiratory manifestations extend from laryngitis and tracheitis through bronchitis to lobular and lobar pneumonia and pleurisy, both "dry" and with serous or purulent effusion. But the characteristic feature, and one which is rarely absent in any severe case, is a condition of capillary bronchitis with intense pulmonary congestion. It may be unilateral or bilateral, is more often basal than apical, but is not seldom universal. The physical signs are copious fine râle (crepitation), with impaired vesicular sound, and, less often, impaired percussion tone. The degree and the extent of this lesion vary from day to day. It is undoubtedly the chief cause of the cyanosis which is so common a feature; it contributes the bloody sputa which are not seldom seen and it embarrasses the heart and, indirectly, the central nervous system. It may be termed the essential lesion of the disease. *Even when consolidation of the lung is present this is quite often an incident by comparison, and if the patient dies he dies with the consolidation rather than of it.* When asked "if the patient has pneumonia" we try to give some comfort by replying that he has not got it yet, when the correct answer would be that he has the first stage of pneumonia already. Whether the patient dies or lives depends upon the extent of this pulmonary congestion, together with the intensity of the toxic process in relation to the central nervous system. It is extremely difficult to form an estimate of how many cases of the severer sort, with this pulmonary engorgement, develop areas of consolidation, because routine examination of the back is impossible, and, indeed, is inadvisable. But the proportion is probably larger than is usually thought.

It is interesting to note that a "sthenic" pneumococcal lobar pneumonia may be, as it were, an intercurrent event, leading to its own signs and temperature curve, and, after resolution, leaving the patient in much the same condition as it found him, save for the further weakness left by the superadded disease. Post-mortem observations show how varied is the flora associated with the incomplete pneumonic areas in fatal cases—pneumococci are present, as would be expected, but streptococci, *S. aureus*, and Pfeiffer's bacillus are found in varying degrees, and not infrequently in much larger numbers than the pneumococci. One sign of the incomplete nature of the process of hepatisation in many cases is the relative infrequency of pleuritic rub over the consolidated area as compared with ordinary cases of pneumonia. The duration of the pneumonic patch is very variable. It may endure for a day only, resolving rapidly with crisis, or it may persist after the pyrexia has gradually ceased (*vide* § IV.). *In the main its existence depends upon the state of the patient's general condition; it clears slowly as this mends, or it spreads rapidly as this lapses.* Cases of true broncho-pneumonia do not seem very common—the name is sometimes given in error to pneumonia of the lobar type when the patches are small and bilateral—apart from infants and little children. Nor is pleurisy common apart from pneumonia. The apparent relative increase of streptococcal, as against pneumococcal, empyemata during recent months may be accounted for by the cases being secondary to influenza with pleurisy.

III.—*The Sputa.*

The sputa vary considerably. They may be absent throughout the whole course, even of very severe cases, including some in which there is intense and widespread pulmonary congestion. When present they include the tenacious mucus of acute tracheitis and bronchial catarrh, the muco-pus and pus of purulent bronchitis, and the rusty sputa of lobar pneumonia. About these sorts of sputa there is nothing characteristic of the disease. Two other kinds occur, however, with some frequency, and both of them are very typical of severe influenza. 1. Bright pink frothy mucus, produced without difficulty and sometimes in large amount, it may be as much as a pint or more in 24 hours. The fresh rose-red colour of this expectoration is very striking, and suggests strongly that it results from acute inflammatory œdema of the lung, which indeed it does, as proved by post-mortem evidence. At times this material is expelled involuntarily during cough and some of it may spurt from the nostrils. 2. Tenacious mucus, less viscid than in lobar pneumonia, of greater amount, and differing also in colour, which may be of several hues—red, brown, saffron, and various tints of green, all of these being present at the same time. Seen in a white earthenware vessel, this type of sputa is very striking and is highly diagnostic. Dr. Hurtley, to whom I gave a specimen of these green sputa, tells me that the chief band present in the spectrum was that of hæmatoporphyrin. Both of these sorts of sputa may occur in the same case and in the order as regards time that they are here described.

IV.—*The Post-febrile Period.*

In a large number of the severe cases, and in not a few of the mild ones, a state of exhaustion quite disproportionate to the duration of the illness follows the pyrexial period. Careful examination often reveals no incriminating feature in any organ. The degree of prostration may be profound, and may be much more trying both to patient and doctor than was the disease itself. Profuse night sweats are common. Various other immediate sequelæ are to be noted.

1. *The nervous system.* The "higher centres" suffer chiefly; marked depression is common, emotional instability is often seen, and suicide is by no means rare. In a few cases a condition of amnesia which was present during the febrile stage persists for some days, then clears away. Neurasthenic states and insomnia which were present before the illness tend to be accentuated, or, if they were yielding to time and treatment when the disease appeared, they are prone afterwards to give further trouble.

2. *The heart.* In most of the instances in which the heart is left in an unsatisfactory state—and they are very many—there is no systematised defect that can be discovered on examination at the bedside. Despite the objection of some cardiologists to the use of the term in this connexion, we can but call many of these hearts "weak." It is reasonable to postulate a state of fatigue, whether of nerve or muscle or both, though no doubt a condition of toxic myocarditis also occurs. But as the symptoms pass off in many of the cases after a few days of continued recumbency, it is not likely that this last-named condition is present in many of the patients who exhibit cardiac inadequacy. Bradycardia of simple type is common, the pulse dropping to 50, 40, and even to 30. This state of things can be shown not to be a dissociated effect—i.e., not a state of heart-block. "Heart attacks," chiefly of the type termed "cardiac asthma," are not uncommon; *the appearance of one of these attacks may be the first sign to an unsuspecting patient or to her friends that all is not well.* These attacks, though very alarming, are rarely fatal. They are seen more often in women than in men. The cardiac element in the attack may be associated with, or may be overwhelmed by, obvious neurosis; the dissociation of the two elements is sometimes exceedingly difficult and the prognosis is correspondingly obscure. Of the ultimate effect of the present severe forms of influenza upon the nerves and upon the hearts of the patients we cannot yet speak.

3. *The pulmonary system* sometimes shows sequelæ during the post-febrile period. The most common condition is the persistence of an area of chronic congestion at one base, with or without a suspicion of pleural involvement. This "soppy" base may be present for weeks, or even for months. (? Whether some of the cases in which this condition is known to have persisted for years are not originally influenzal in origin.) Pneumonic patches may be found during this period. They are of two kinds: (*a*) areas of unresolved pneumonia, and (*b*) what may not inappropriately be termed "residual consolidation"—patches of pneumonia that appear with, or just after, the fall of temperature. These areas usually clear quietly and slowly, their duration depending chiefly upon the progress made by the patient in tone and strength: the more rapid the general improvement the quicker does resolution take place. Pleural effusion may be discovered during the afebrile stage and may call for aspiration. The fluid is serous, is either sterile or contains scanty streptococci, and the occurrence of the effusion by no

means indicates that the patient is tuberculous. No doubt the discovery of some of these pulmonary lesions during the post-febrile stage is due to lack of adequate examination during the more acute period of the disease, but this is certainly not the explanation in all cases.

V.—*Diagnosis.*

Experience of the present epidemic throws light upon the nature of many obscure cases which occurred during the past summer. It is now obvious that these were sporadic cases of the now prevalent disease. As in some other epidemic and endemic diseases it is common to see the main wave of incidence preceded by small ripples, so in influenza. (Cf. cerebro-spinal fever.) This fact leads to the appearance of individual cases, often quite severe, the nature of which, in the absence of bacteriological or other criteria of an absolute kind, remains obscure until a flood of cases of a similar sort establishes the diagnosis.

Early in July two boys and their mother were admitted (from the same house) to St. Bartholomew's Hospital. The mother's illness took the form of a moderate pyrexia with diarrhœa. Both boys were gravely ill, with high continued fever, relatively low pulse-rate, marked cerebral irritation—in one there was definite "meningism" leading to lumbar puncture with a view to exclude cerebro-spinal fever—dry tongue, and constipation. A leucopenia was present in both cases. There was widespread pulmonary congestion, but no signs of pneumonia. There were no spots, the spleen was not palpable, blood cultures were negative, and no agglutination was obtained against *B. typhosus* and *B. paratyphosus*. All three cases recovered. In face of these data no diagnosis could be, nor was, made. How simple the diagnosis would be to-day!

I can think of no less than six cases of severe illness, seen during the summer, with high temperature, marked nerve prostration, leucopenia, and negative blood culture, in all of which the diagnosis of typhoid or para-typhoid would have been made but for the absence of agglutination. In four of them the degree of pulmonary congestion was not more than is frequently seen in typhoid fever, although in the other two cases it certainly was. But *the likeness of severe influenza to typhoid fever* may be closer than this. In August I was asked to see a young doctor on the tenth day of his illness because he was passing a large quantity of blood by the bowel, following upon a dose of calomel. The onset of the disease had been sudden, with a rigor. When I saw him he was running a persistently high temperature (104–5°), his pulse-rate was not above 90, he was tremulous, delirious, had sordes on lips, his face was dusky, and his abdomen was distended. He had no typhoid spots and his spleen was not palpable. There was congestion of the base of the right lung, but not to a marked degree. He continued to pass blood freely for 48 hours. A blood culture was negative, as also were agglutination tests. He developed an incomplete pneumonia and died on the seventeenth day of his disease. I have recently seen a similar case in which the enterorrhagia followed the use of an enema.

By no means all the pneumonia now prevalent is influenzal. There are a goodly number of cases of uncomplicated pneumonia of pneumococcal origin, both the lobar type in adults and the lobular type in children, and the prognosis in most of them is, as usual, not unfavourable. This should be remembered in view of the present very natural popular dread of a dire result whenever pneumonia is diagnosed. Careful analysis of the mode of onset of the pulmonary event, the clinical features of the case, and, when possible, bacteriological results will usually lead to a correct differential diagnosis.

Poliomyelitis is evidently rife at the present time, contrary to the usual seasonal incidence of the disease. The early symptoms may easily be mistaken for influenza when the latter disease is so ubiquitous. I have recently met with a small outbreak of poliomyelitis in a boy's school, in which 150 boys out of 200 were affected by influenza. Six boys fell victims to the virus, all of them 15–16 years old and five out of the six were in the same house. In two of the cases it is certain that the influenza preceded the poliomyelitis by a definite, though short, interval; in one it is probable that the reverse order of infection was observed; in the remaining three cases both infections would seem to have occurred simultaneously. It is not at all unlikely that some of the cases of "neuritis" following influenza, in children and in young adults, are really cases of this disease. The importance of diagnosing the condition as early as possible is obvious.

VI.—*Prognosis.*

Despite the protean nature of the disease and the many grades of severity that the clinical picture may assume, prognosis is not found to be so difficult as is often supposed. The real crux in the early stages of the disease is the question, Which cases are going to be severe and which are going to be mild? The degree of suddenness, or rather the degree of initial intensity, of the onset, does not decide, nor the height of the pyrexia during the first 48 hours, nor the amount of the patient's discomfort. *If the patient comes under treatment late this fact is of bad omen;* nearly always the case is severe, very frequently it is fatal. 1. Fulminating cases are, of course, rapidly fatal; there is never any doubt as to their issue. 2. Next to the fulminating cases the outlook is worst in those patients who sink progressively into a state in which there are cyanosis, delirium or stupor, diminishing cough, high continued fever, and physical signs of extensive pulmonary congestion. *If this condition is reached rapidly, such as any time before the sixth day, the case is usually fatal.* 3. Of less gravity, but still with a very serious outlook, are the cases in which after four or five days of moderately severe illness the temperature rises suddenly to a higher level, continues there, and signs of patchy consolidation of lung appear. 4. Cases of purulent bronchitis, with patches of broncho-pneumonia, cause great anxiety, but usually give time for treatment; they are more hopeful. 5. If a "sthenic" lobar pneumonia supervenes upon a fairly mild attack the prognosis is still less serious, even though, as already mentioned in § II., no complete crisis is likely to occur. 6. In simple pleurisy the outlook is good, whether liquid effusion arrive or not. 7. Bronchial catarrh is the least unfavourable of all the pulmonary events, and rarely leads to a fatal issue unless it be in the elderly and in infants.

Speaking of other than pulmonary complications, the following points appear to be in the patient's favour: an age which is below 20 or above 40 years, irregularity of the pyrexia as contrasted with high continued fever, catarrh of the upper respiratory tract and air passages, coarse as contrasted with fine râle on auscultation of the chest, mucopurulent sputa rather than tenacious and bloody mucoid sputa, strict correspondence of the temperature curve with the pulse-rate, absence of cyanosis, and a moist skin. In addition to the bad points to be inferred *per contra* from this list, the following also tell against the patient's chances: delirium, stupor, insomnia, persistent vomiting, and repeated diarrhœa.

Postscript on Treatment.

Further experience in the treatment of the more severe class of case now occurring has but confirmed the views expressed in THE LANCET of Nov. 23rd as to the great value of aero- and hydro-therapeutic measures. A free current of air, both in the room by means of widely open windows and over the patient's body by means of a "cradle" and very little bed covering, frequent sponging, the fearless use of the cold pack when hyperpyrexia is present: these measures are of greater service in the intensely toxic cases with high fever than are febrifuge drugs, which usually fail of their object and depress a heart which is already hard put to it to maintain the struggle. *In these very bad cases sweating does not occur, and it is useless to attempt to get it.* In them heat is lost from the body by radiation, and to this process many blankets are a deterrent and not an assistance. If the skin is losing heat by way of sweating well and good, let it be encouraged by warm blankets, but there is here no cause for much anxiety. The anxious cases are those in which sweating does not occur (I am speaking of the earlier stages of the disease), and in them the removal of heat and the consequent adjustment of the body temperature should be provided for in the manner above indicated. It may seem a matter of supererogation to point out this distinction, and yet it is one which is not infrequently lost sight of in practice. I am still more convinced of the necessity of caution against overfeeding, both as regards the quantity and the character of the food. So-called specific drugs continue to be very disappointing. The creasote and iodide mixture that has been advocated does not seem to justify itself, either with pneumonia present or not; it not seldom causes vomiting, and thus introduces an additional difficulty in the case.

THE USE OF VACCINES IN ACUTE INFLUENZA

AND INFLUENZAL BRONCHO-PNEUMONIA.

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THE object of this paper is to call attention to the successful results obtained by the treatment of acute influenza and influenzal broncho-pneumonia with adequate doses of vaccine containing *B. influenzæ*, streptococci, and pneumococci.

Principles of Treatment.

The recommendations of the Conference held at the War Office on Oct. 14th, which have been adopted by the Army and Local Government Board, show a certain timidity in the use of vaccines for treatment.[1] Whilst recommending prophylactic inoculations with, what I consider to be, entirely inadequate doses, they state that vaccine is most likely to be of service in the treatment of subacute and chronic cases, and recommend a dose of 6 million *B. influenzæ*, 20 million pneumococci, and 8 million streptococci as an initial dose. As regards severe cases of secondary broncho-pneumonia they do not recommend vaccine, but if it be desired to treat such cases an initial dose of 1½ million *B. influenzæ*, 5 million pneumococci, and 2 million streptococci is suggested.

The treatment of influenzal broncho-pneumonia in no way differs from the treatment of acute pneumonia and broncho-pneumonia due to other causes. In a paper in which I recorded the results obtained by the early administration of vaccines in acute pneumonia[2] it was urged that the best results were obtained by injecting an adequate dose as early as possible. 100 million pneumococci were given as an adequate dose for an adult man. Since then acute pneumonia has been consistently treated, not only by myself, but by many practitioners all over the British Isles, according to the principles laid down with excellent results. Broncho-pneumonias of all kinds have been similarly treated.

Influenzal broncho-pneumonia during an epidemic period resembles acute lobar pneumonia in that a suitable stock vaccine can be kept ready for use, whereas with other broncho-pneumonias time is lost in discovering the nature of the infection and making the appropriate vaccine.

For the treatment of influenza and its secondary broncho-pneumonia Lord Fisher's advice is appropriate: "Strike early and strike hard." The first moment the patient is seen is the time to inject, and the dose should be sufficiently large to produce a satisfactory response within a few hours. Hesitation and delay are fatal. Every case should be regarded as a serious one. Many cases beginning mildly rapidly get out of hand if untreated and prove fatal. Action must be decisive—offensive, not merely defensive. Drifters must not be sent into action when battle cruisers are required.

My practice is to inject, and advise others to inject, every acute case seen in the early stages of the disease, unless the patient is obviously beyond help. At first I used 50 million pneumococci, 50 million streptococci, and 30 million influenza bacilli as an initial dose in an adult, gradually increasing to 100 million and 60 million respectively if further doses were required. Now I more often begin with a dose of 80 or 100 million of all three organisms, and find more decisive results in aborting the disease are obtained. In a certain group of cases *B. Friedländer* was found, and for these this organism was added to the vaccine. These therapeutic doses are larger than those recommended by the War Office Conference for prophylaxis, and very much larger than those suggested for the treatment of acute cases. The pneumococci used in the vaccine were obtained from recent cases in primary culture, the streptococci were also recent strains and, as far as possible, in primary cultures. The influenza bacilli were partly isolated by myself, partly obtained from Messrs. Parke Davis, and Co.

[1] THE LANCET, 1918, ii., 565.

[2] Brit. Med. Jour., March 13th, 1915.

Record of Cases.

Some hundreds of patients have now been treated on these lines by myself and by practitioners associated with me. During the present rush of work complete statistics are not yet available. Of cases directly under my care there has only been one death among those inoculated within 48 hours of the onset. Several doctors have told me that they have had no deaths in inoculated cases. The few cases here briefly recorded with their charts are taken from a large number. They are in no way exceptional, and are given as showing what may be expected of vaccine treatment in various types of the acute disease.

A. *Acute Influenza, Uncomplicated.*

CASE 1.—A young woman aged 26. Injected about eight hours after onset with 50 million pneumococci and streptococci, 30 million influenza bacilli. Respirations 30, pulse 96. Pains severe, suffused eyes. Pharyngitis. No complications. Temperature reached normal nine hours after injection. During the second night it rose again to 99·4° and thereafter remained normal.

CASE 2.—A man aged 40. Onset severe and rapid with shivering, intense pains, slight vomiting, furred tongue, explosive cough. Pulse 108, respirations 30. Injected about three hours after onset with 100 million of each organism. Temperature reached normal 24 hours after injection. Labial herpes appeared on the third day. No further rise of temperature, but some cough for four days.

CASE 3.—A boy aged 8. He left home for school at 8.30 A.M. and arrived back three hours later scarcely able to stand, shivering, giddiness, severe headache, and nausea. Injected at 1.30 P.M. with 20 millions of each organism. Temperature was then 102·6°. Next morning temperature had fallen slightly, but rose later to 103·8°. On the morning of the third day a dose of 40 million of each organism was injected. This was followed by a fall in the temperature, which reached normal during the afternoon of the fourth day. Weak breath sounds and sticky crepitations were heard at bases of both lungs. This was one of the very few cases of simple influenza which required a second inoculation to cause a fall in temperature.

These three patients were injected within a few hours of the onset, but other charts could have been given showing a similar fall of temperature when the initial dose was given after two, three, or four days of sustained temperature.

I have seen no similar charts in uninoculated cases. Occasionally mild cases are seen with a pyrexia of 48 hours, but a duration of 4 to 6 days is more usual. Occasionally a fall by crisis is seen in untreated cases, but lysis is the rule. As crisis has almost invariably followed a single adequate dose of vaccine in my cases of simple influenza at whatever stage of the disease, it is difficult to resist the conclusion that they are related as effect and cause.

B. *Acute Influenzal Broncho-pneumonia.*

CASES 4, 5, 6, and 7 may be taken together. The patients were all young men. They were typical cases of the moderately severe type. There were dullness, weak breath sounds, and many crepitations at the bases of both lungs, with small areas of bronchial breathing, moderate cyanosis, respirations 28 to 32, pulse 100 to 120. Blood-stained, frothy sputum in Cases 4 and 5, frothy muco-purulent in the other two. Considerable distress in all four. Case 4 was injected about 24 hours after the onset with 70 million pneumococci and streptococci and 40 million influenza bacilli. The temperature after first rising slightly fell rapidly and reached normal 24 hours after the injection. No further injection was required. Case 5 was not injected until the third day; the disease was of a more severe type, and a dose of 100 million pneumococci and streptococci and 60 million influenza bacilli was given, followed by a fall of temperature to 100°, then after a rise to 102·2° it reached normal early on the fifth day. As the temperature did not quite settle a second injection was given on the sixth day. Case 6 received a dose of 80 million of each organism on the third day, and had a normal temperature early on the fifth day. Case 7 reached normal 24 hours after an injection of 100 million pneumococci and streptococci, 60 million influenza bacilli.

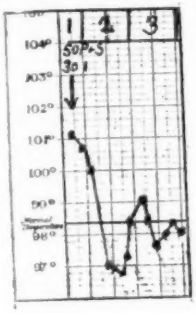
CASES 5, 6, 7, and 10 belong to a group of 17 patients from the same community admitted with influenza. Of these, 9 had broncho-pneumonia. Five not under my care were not inoculated and 4 died, the remaining 4 were inoculated and all survived. The cases, however, cannot be taken as strictly comparable, as three out of four of my cases gave rise to no special anxiety, although it is difficult to say what they might have become had the fever not been cut short.

C. *Very Severe Confluent Broncho-pneumonia.*

CASE 8.—A young woman aged 25. Symptoms began with great severity, extreme cyanosis, prostration, weak pulse, extensive signs throughout both lungs with large confluent patches at bases, sleeplessness, and delirium. Condition extremely critical for five days. Respirations reached 48, pulse 120. The first injection of 50 million pneumococci and streptococci and 30 million influenza bacilli caused a critical fall of temperature from 104° to 97°, a second dose on the fourth day was followed by a more gradual fall, after which the temperature remained normal. Two more injections were given later and were followed by general improvement. On the tenth day she had left femoral thrombosis.

CASE 9.—A man aged 50. A case of the worst kind in a stout, flabby man with a bad alcoholic history. Enlarged liver, much albumin with casts and pus cells in urine. Very severe onset. Respirations 50 on first day. Pulse did not exceed 112, but was very feeble. At first much struggling and attempts to get out of bed, later muttering delirium and picking at bedclothes. Crepitations all over both lungs, large confluent patches involving the whole of both lower lobes, explosive exhausting cough with little sputum. Retention of urine. Much

1



CASE 1.—Female, aged 26. Influenza, uncomplicated.

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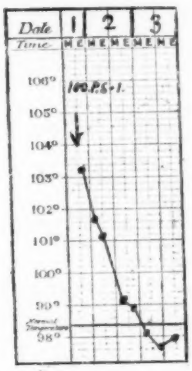
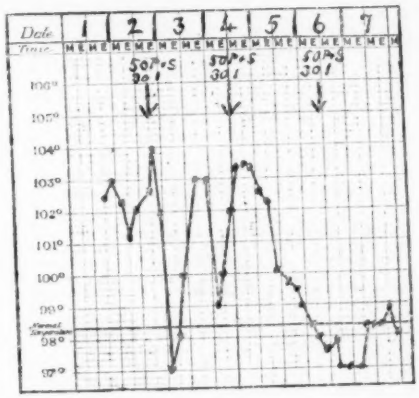


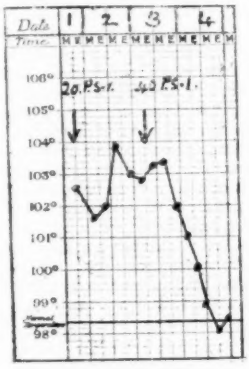
CASE 2.—Male, aged 40. Influenza, severe onset.

8



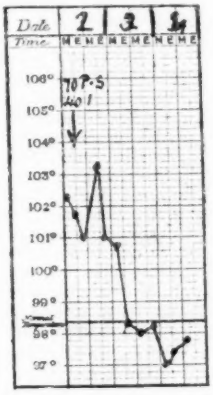
CASE 8.—Female, aged 26. Very severe confluent broncho-pneumonia.

3



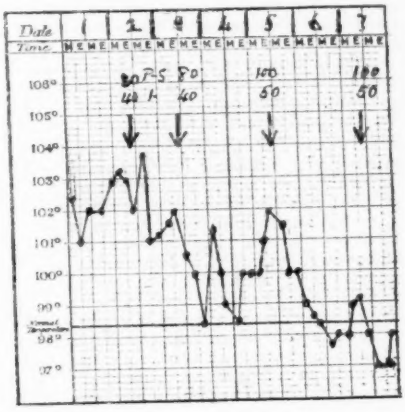
CASE 3.—Male, aged 8. Influenza, severe onset.

4



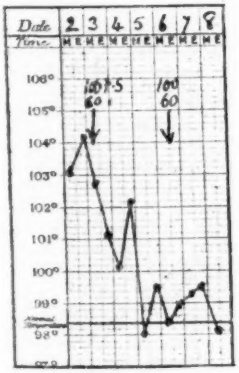
CASE 4.—Male, aged 38. Influenzal broncho-pneumonia.

9



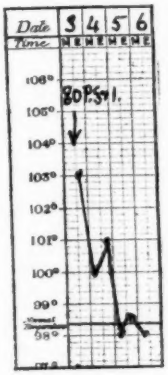
CASE 9.—Male, aged 50. Very severe confluent broncho-pneumonia.

5



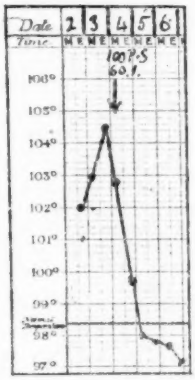
CASE 5.—Male, aged 28. Influenzal broncho-pneumonia.

6



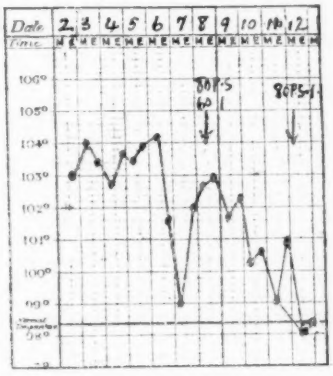
CASE 6.—Male, aged 24. Influenzal broncho-pneumonia.

7



CASE 7.—Male, aged 23. Influenzal broncho-pneumonia.

10



CASE 10.—Male, aged 23. Very severe confluent broncho-pneumonia.

cyanosis. Each injection was followed by a fall in temperature, and after the third the normal temperature persisted. Two more injections were given during convalescence. This patient also had left femoral thrombosis during convalescence. These are the only two patients in whom I have seen this complication.

CASE 10.—Man aged 28. This patient was not seen until the eighth day, when he appeared to be dying. He had extensive confluent broncho-pneumonia, with a respiration-rate of 52. He was lying in a condition of stupor, with weak flickering pulse. He was injected with 80 million pneumococci and streptococci and 50 million influenza bacilli after some hesitation as to whether it was worth while. From that time he steadily improved and two days later respirations were 26. A second inoculation was made on the twelfth day and temperature became normal.

These patients were as desperate as any I have seen, and I feel sure would not have recovered if vaccine had not been used.

The youngest patient injected was a baby of 12 months. Her illness began with convulsions. She was seen by me towards the end of the second day and then had well marked broncho-pneumonia. An injection of 15 million of each organism was given. The child was then listless, peevish, and obviously ill. When seen 38 hours later she was sitting up and playing.

The oldest patients were a husband and wife, aged 69 and 68 respectively, both bad subjects, with severe broncho-pneumonia. 80 million of each organism were given on the first and second days respectively and each patient made a good response. Several children of 10 and 12 years have been injected with doses of 50 million and children of 3 and 4 years with 20 million. In all cases with good results.

Results of Curative Vaccination.

In no case have I seen any bad result from the use of vaccine in these doses when used early in the disease. If it may be argued that vaccine has no curative action in acute diseases a study of these cases will show that at least it does no harm. A constant feature has been the drop in temperature following an injection. This if standing alone might mean little, or if associated with collapse would be a bad sign, but in these cases the fall of temperature is associated with general improvement, the aspect of the patient is better, the pulse is slower. In acute lobar pneumonia the respirations are slowed *pari passu* with the temperature and pulse. In influenzal broncho-pneumonia, if the respirations are rapid they are slowed with the fall of temperature, but in the serious cyanotic cases with slow respirations the rate is increased. In Case 8, for instance, during the critical days the respirations were 20 to 30, but after the temperature became normal the rate increased to 48. At first the respiratory centre is depressed, but with improvement comes stimulation of the centre before it returns to normal. The results obtained in influenzal broncho-pneumonia are similar to the results obtained for several years in acute lobar pneumonia and other types of broncho-pneumonia. The charts given here have a close resemblance to those published in the article on vaccines in acute pneumonia already referred to. Such results cannot be explained otherwise than by assuming that the injection of an adequate dose of vaccine causes a satisfactory immunising response.

The Question of Dosage.

When I first used vaccines in these diseases such small doses as 5 million were given. Although occasionally good results were obtained they were uncertain. With further experience the doses became larger and the results better. In acute pneumonia, when 100 million pneumococci have not given a satisfactory response the dose has occasionally been increased to 150 or 200 million cocci. If a dose insufficient to produce improvement is given there may not be time to give a second. The first dose must be an effective one. The doses now recommended in acute influenza and influenzal broncho-pneumonia are: for an adult man 80 to 100 million pneumococci, streptococci, and *B. influenzæ*; for an adult woman 60 to 80 million; for a child of 12 to 14, 40 to 50 million; for a child of 2 or 3 years 10 to 20 million. In deciding the dose the size of the patient is more important than the age. The dose should not be reduced because of the gravity of the illness. If the first dose gives no, or an insufficient, response the next dose should be larger, the doses being repeated on alternate days, or even in some cases every day. With a first dose of 100 million it is rarely necessary to increase this.

The timidity so often shown even by those who use vaccines in chronic diseases towards their use in acute diseases apparently arises from theoretical considerations as to the possible harm caused by negative phases. This is not the place to enter into a theoretical discussion on the mode of action of vaccines in acute diseases. My attitude for the moment is the pragmatist's, "It is true because it works." But it may be pointed out that the doctrine of the negative phase was worked out in patients suffering from chronic localised diseases. The conditions existing in healthy persons and in patients with acute disease are very different and not comparable.

Those accustomed to vaccine therapy know that in the treatment of chronic localised diseases—chronic arthritis, mucous colitis, chronic bronchitis and asthma—considerable reactions may be produced by quite small doses, and great care is necessary in increasing the doses. The patient appears to be "sensitised" in a different manner to those suffering from acute disease. Again, a dose of ·000,0001 c.cm. tuberculin may cause a smart reaction in a case of chronic localised tuberculosis, but would have no effect in a case of advanced phthisis or acute caseous broncho-pneumonia. One possible explanation may lie in the very different amount of infection in the two cases. A dose of 100 million pneumococci is very small as compared with the inconceivable number of cocci in the body of a patient suffering from acute pneumonia, but becomes appreciable when compared with the number present in a case of chronic otitis media.

Prophylactic Vaccination.

These considerations have a bearing on the use of vaccines for prophylaxis. Doses which seem inadequate are being recommended apparently from the fear of a period of increased susceptibility following upon inoculation, or of the possible danger of inoculating a patient during the incubation stage. Within certain limits the period of immunity depends upon the size of the dose inoculated, the limits being set not so much by the actual quantity of vaccine used as by the amount of antigen which the tissues can set free from it. With typhoid, doses of 1000 million and 2000 million are necessary to produce immunity lasting a reasonable time. With the pneumococcus Lister advises three inoculations at seven days' interval, each dose consisting of 6000 million cocci of each of several groups. He found that injection of very large doses was followed by only slight reactions. Sir A. E. Wright found that doses up to 40,000 million pneumococci produced nothing more than a very slight constitutional disturbance and a very small rise of temperature. Cole and his fellow-workers agree with these observations. We have no similar data with regard to influenza bacilli and streptococci. But doses of 300 up to 1000 million of these have been given for treatment. Further, as regards the possible danger of inoculating a patient during the incubation stage, Wright[3] has shown that 2500 men inoculated with doses up to 1000 million pneumococci had an incidence rate during the four days following inoculation only one-third that of 750 uninoculated controls—in other words, vaccine therapy is highly successful when applied during the incubation stage. I consider the incubation stage of all times the best to inject for treatment if we could discover it in the individual.

Prophylactic injections have been given to 230 persons, 100 million of streptococci and pneumococci and 50 million *B. influenzæ* being used as a first dose, and after a week double these doses to 90, but as there is no good reason for reducing the number of influenza bacilli the last 140 have had equal numbers of each organism. In some cases a third dose of 400 million and in a few a fourth of 800 million has been given.

At one institution 117 nurses and ward maids out of 170 were inoculated; 112 twice and 5 once. Of the 112, 2 have since had mild attacks; of the 5 one had a mild attack and one severe broncho-pneumonia. Of the remaining 53, 25 had mild attacks in June and all have escaped this time; one had a mild attack in February and has recently had very severe broncho-pneumonia; 14 of the remainder of the non-inoculated have had influenza during the present epidemic, 2 with severe broncho-pneumonia, of whom one died. The figures are not strictly comparable as they do not cover the same periods, the outbreak among the 14 immediately preceding, and, indeed, being the occasion for the inoculation of, the remainder; but so far as they go they suggest that inoculation with these moderately small doses gives some slight measure of protection, and also that an attack of influenza confers immunity for a limited period. Of the remaining 113 inoculated I so far know of only 2 who have since had influenza. No case fell sick during the four days immediately following an inoculation.

[3] THE LANCET, 1914, i., 91.

SOME OBSERVATIONS ON THE RECENT INFLUENZA EPIDEMIC

AT A BASE HOSPITAL IN FRANCE.

BY D. T. HARRIS, M.B., CH.B. MANCH., M.B., B.S. LOND.,
CAPTAIN, R.A.M.C.; RESEARCH PATHOLOGIST TO THE CHRISTIE HOSPITAL, AND LECTURER IN PHYSIOLOGY AT THE UNIVERSITY, MANCHESTER.

I.—*An "Intensive" Culture Medium for the Isolation and Growth of Pfeiffer's Bacillus.*

As the growth of *B. influenzæ* is better in association with staphylococcus than in pure culture, it appeared that possibly the basis of the symbiosis was a pabulum created by a proteolytic ferment generated by the latter organism, containing all the split-products of protein in all stages of cleavage. If this were true, then *B. influenzæ* would be expected to grow abundantly in the presence of an active tryptic ferment in the medium. The simple method of trypsinising whole blood and adding it to ordinary nutrient agar yielded a prolific growth of the organism. Strict asepsis must be observed in the technique, as subsequent sterilisation is inadmissible, the whole point of the method being to avoid the inactivation of the ferment.

A simple method adopted was the following:—

Into a 10 c.cm. syringe containing 3 c.cm. of citrated (1 per cent.) physiological saline, 5 c.cm. of rabbit's blood is drawn; this is quickly added to a mixture of 5 c.cm. citrated saline with 2 c.cm. liq. trypsinæ co. contained in a test-tube. The whole is mixed and placed in the incubator for one hour to start the proteolysis of the serum-albumin and globulin. Meanwhile, 100 c.cm. of nutrient agar (acidity + 10) in a 200 c.cm. flask is cooled down to 46° C. in a water-bath. The trypsin-blood, previously placed for a minute or two in the bath, is added to the agar at 46° C. Ten plates are quickly poured, and afterwards stored in the ice-chest until required.

The red blood cells are not too far altered by this treatment to preclude facility in making observations on the hæmolytic power of organisms, provided that growth has not exceeded 24 hours in the incubator, for in the latter case the red cells would be completely digested by the ferment.

This medium may be used with advantage for the growth of other delicate organisms—e.g., the gonococcus.

Note on oxygen supply.—For the growth of obligatory aerobes it has been shown that the essential constituent in blood media is the hæmoglobin. Is the function of the Hb to provide a readily available supply of oxygen? To determine this point, an agar medium was made in which neutralisation was effected by the chemical equivalent of sodium peroxide in place of caustic soda. The employment of this peroxide is confronted with technical difficulties. Since prolific growth on potato may be due to the presence of oxidases and peroxidases, one may possibly find that the addition of minute quantities of certain colloidal metals will be easier to incorporate in media for the same purpose. The call for oxygen by these obligatory aerobes is probably due to the necessity for the rapid oxidation of products like lactic acid, which inhibit growth.

II.—*The Extreme Prostration and the Involvement of the Suprarenal Capsule.*

Perhaps the most striking feature of the present influenza epidemic is the extreme prostration. Suddenly the patient appears to lose his physiological resistance completely, and in 24 hours the pulse becomes almost imperceptible. This atonia drew attention to the condition of the suprarenal body. In the first autopsy (in which the heart, spleen liver, and kidneys were normal) the left adrenal was soft, diffluent and congested. On examining histologically it revealed multiple hæmorrhages in the medulla extending into the zona reticulata of the cortex and œdema of the cells of medulla and cortex. (Further examinations were held up by routine work.)

It is possible that adrenalin in small doses, repeated four-hourly, might prove useful during this period of marked asthenia, to be followed in convalescence by the administration of suprarenal capsules until repair is complete. The arterial tension might be used as an index for the control of treatment.

III.—*An Organism Resembling* B. pestis *in Appearance.*

Introduction.—Cultural examination of the aseptically obtained lung-juice from a case of "influenza" eight hours after death gave an organism resembling *B. pestis* in appearance. To eliminate the possibility of it being one of the many types of organism found post mortem the lung-juice was aspirated immediately after death (within a quarter of an hour) in the second case. From these two cases—both German prisoners of war—similar colonies grew out.

It was not until a fortnight later that the same organism was isolated from the throats of "carriers"; these were again two German prisoners of war, who had been sent in for bacteriological diagnosis of diphtheria and were found to be negative. [It may be of interest to record here that in two cases of death from this "influenza" the Klebs-Löffler bacillus was recovered from the lung. Aphonia had been a symptom in one of these cases.] The characters of the plague-like organism will now be given:—

Morphology.—The organism is remarkably pleomorphic. The type found in parent culture is a short plump bacillus. Its breadth ranges 1–2 μ; its length varies, mostly 2–3 μ; here and there longer forms may be met with up to 4 or 5 μ.

Staining characters.—The most striking characteristic is the marked polar staining. The organism stains well with aniline dyes. It does not retain the stain in Gram's method.

Cultural characters.—Isolation and growth are difficult in comparison with *B. pestis*. The organism was first isolated from the top, shallow, partially desiccated film of a serum slope. This suggested that it grew best on a hypertonic neutral medium; subcultures were therefore made on 2 per cent. salt neutral agar plates.

The parent growth on serum appears as a white colony about 1–2 mm. diameter in 24 hours. Subculture on gelatin proved a failure on two occasions. Subculture on salt-agar yields dense cream-coloured circumvallate colonies up to 3 mm. diameter in 24 hours; these show chains of bacilli and pear-shaped involution forms. (Hankin describes similar forms for *B. pestis* grown under the same conditions.)

Pathogenicity.—This has not been satisfactorily investigated. Only subcultures on salt-agar have been tested, and these were found to be avirulent: hypodermic injection of a rat caused 3 or 4 days' illness with subsequent recovery, whereas intraperitoneal inoculation of a guinea-pig only served to sharpen the appetite.

Further investigation with early cultures on a less attenuating medium is desirable.

Conclusion.—The organism thus agrees with *B. pestis* in morphology and staining characters, but isolation and growth are far more difficult than with *B. pestis*. Its virulence, if any, may depend on the concomitant action of some other organism—e.g., *Streptococcus brevis* or *viridans*—similar to what is suggested for Pfeiffer's bacillus.

I wish to express my thanks for the interest taken by the Assistant Adviser in Pathology for the Calais area (Captain E. L. Horsburgh, R.A.M.C.) in the verification of my observations.

SOME CLINICAL ASPECTS OF LONG-STANDING PULMONARY TUBERCULOSIS.

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ASSISTANT MEDICAL OFFICER, BROMPTON HOSPITAL SANATORIUM, FRIMLEY.

THE last decade has seen a wide dissemination of knowledge with regard to pulmonary tuberculosis among the medical profession. Thanks more to individual apostles than to the teaching of the medical schools, practitioners now think far more frequently of tubercle in patients showing pleurisy, hæmoptysis, or intractable cough, and realise that in the great majority of cases these events signify pulmonary invasion, and in most cases metastasis from a previous lymph-gland focus. Meanwhile the books and journals English and foreign, shower on their readers methods devised to facilitate a yet earlier diagnosis.

While, therefore, current medical literature abounds in appeals for the early diagnosis of *early* tubercle, it may seem odd that one should have to plead for the early diagnosis of *late* tubercle. But the fact remains that one sees case after case in sanatoria, in which pleurisy or hæmoptysis occurred seven or eight years ago, after which the patient was lost sight of from a medical point of view, and consequently was not thought of as a possible case of phthisis when he applied to a doctor after some years for the relief of further symptoms.

So benign is the course of phthisis, that many of these patients whose treatment only lasted a week or two at the time of the original manifestation, have maintained reasonable

health and working capacity over several years without attaining pathological healing. This was very obvious in the review of recruits for the Army, where in so many cases men were accepted not as cases of obsolescent tubercle fit for service, but simply without any recognition that they were in any way abnormal. Many have stood military life well; many, alas, have gone under.

Non-recognition of Cases and its Results.

That some of these cases should have escaped recognition need cause one no surprise; there are many conditions much more easily observed. In the absence of careful history-taking, and with a frequent absence or denial of sputum on the part of the patient, a cursory chest examination on the traditional lines may not rouse suspicion, since compensatory changes in the chest have a marvellous power of masking signs, especially in men, in whom the round, silent, emphysematous chest is commoner than in women.

The chest may be reasonably resonant, except perhaps at the extreme apices, and there may be no adventitious sounds of any kinds. The breath sounds may be weak or slightly harsh in quality, but more or less equally so all over. But while in some cases the physique may be good, careful inspection of the chest is generally enough to provide the necessary clue. Shelving apices and local rib deformities and asymmetries, supraclavicular hollows, muscular wasting about the shoulder-girdle, heart displacements, localised respiratory movements, and the use of extraordinary accessory muscles of respiration; some or all of these will help to indicate the damage that has been done.

The result of these cases being missed is that many patients who are really old chronic phthisical subjects, are not recognised as such when they first begin to feel run down, and too often it is only when they have gone on to breakdown, and their chests are a mass of squeaks and crackles that they are diagnosed at all. The fortunate few who find their way to a sanatorium when their initial manifestation of pulmonary invasion occurs, learn automatically that they have consumption. They are marked down as tuberculous; and that greatly to their advantage, since a subsequent toxæmic bout is less likely to be passed over as influenza, and the past history is much more likely to be brought to the notice of the medical attendant.

But even assuming that the old obscure fibroid cases are lucky, and previous to breakdown get swept into the net of the tuberculosis institutions, even so, they are not always recognised at once for what they are. Charts of their chest condition are handed about from one place to another, with perhaps a few strokes across the clavicles and "no adv. sounds," just as though they were cases of early pulmonary deposit. This is most unfortunate, because their difficulties and their treatment are not entirely the same as those of the early case. Most of the ordinary canons of sanatorium routine are common to both. Both must have rest until toxæmia has subsided. But the old fibroid cases have a disability which the early cases do not present, and I should prefer to call it their *mechanical disability*.

Oxygen-want.

Generally speaking, they have achieved all the compensation of which they are capable, and their response to exertion varies according to the extent of the damage to their respiratory apparatus. The early case has no marked difficulty in getting his blood oxygenated. If he is at all dyspnœic it is generally a toxic manifestation which disappears with his toxæmia. But the old chronic remains dyspnœic on exertion when quite free from toxæmia, and his disability is reflected in his colour oftener than the text-books would lead one to suppose. Unfortunately, most doctors only recognise a person as "cyanotic" when he is (in the modern sense of the word) quite blue, as in congenital heart disease or some cases of "idiopathic" emphysema. But this intense blue appearance represents more than pure oxygen-want. It is oxygen-want plus venous congestion, and the cyanosis of old tubercle and other conditions is not always a striking blue, but more often an ashen, livid, or leaden tint. It may be that the blue colour occurs where there is some degree of right heart congestion; in many of these chronic cases we certainly get some objective evidence of the heart working under strain, but unfortunately little work has been done as yet, which enables one to estimate the amount of the mechanical disability directly attributable to the myocardium. The main thing to recognise is, that when a tuberculous person is cyanosed or livid, his blood is not properly oxygenated for the degree of activity in which he has at that moment engaged. He may not complain of dyspnœa except on strenuous exertion, though his respiration may be increased both in rate and depth. The range of automatic compensation is wide. I have even seen patients engage in a short period of obvious forced breathing at the sight of a hill, thought quite unconscious of the fact!

But the question is, To what extent does this slight chronic oxygen-want matter? More, it may be, than is usually supposed. Apart from any theoretical disadvantage to viscera already past their prime, there is reason to think that it may be a direct cause of physical and mental ill-health. Many chronic tuberculous subjects who show none of the ordinary signs of tuberculous toxæmia, who keep an afebrile chart, and whose signs are quiet nevertheless complain of vague malaise, with many queer subjective symptoms, some of sympathetic type; sinking feelings, feelings of constriction, palpitation, insomnia, headache, nausea, depression, and nervousness, and other sensations reducing both their comfort and their working capacity. One cannot attribute all of these to the imagination or to indiscretions in diet. It is naturally most difficult to place them accurately, but perhaps it will be possible eventually to separate the syndrome of "anoxæmia" from that of tuberculous toxæmia, when the effects of slight oxygen-want over long periods are more definitely understood. This is certainly one of the directions in which increased coöperation is required between the physiologist and the clinician.

Relation to Classification and Treatment.

In handing on these cases to the care of another, it is plainly going to help him very little in assessing their capacity or recording their progress, to know that they are "ambulant afebrile," or that they come into Class 2 or 3 of Turban's grouping. Nor does Philip's valuable method enable one to record shortly *all* the essential factors. But with a small modification it would do so. In any case of pulmonary tuberculosis one wants to record shortly: (1) extent of lesions; (2) degree of toxæmia; and (3) mechanical disability; and this might well be done by the combination of the letters L T M, numbered from 0 to 3. Thus cases like those under consideration would often be $L_3T_0M_1$—extensive lesions, no toxæmia, slight mechanical disability. In so far as shorthand notes of cases are of value, such a method would cover the essential factors of pulmonary tuberculosis in all its stages. And in actual practice such a note certainly makes for careful observation of patients, by continually drawing one's attention to fundamentals. It is especially in institutions that patients are so liable to go automatically through a routine, unless anything gross happens to call attention to their particular needs.

Again, in special treatments, like artificial pneumothorax, it is most essential to consider all the factors involved. It is of doubtful advantage to an old fibroid case (except as a life-saving operation) to flatten out his foci by collapse therapy, and at the same time to leave him with too little lung to carry on his occupation with comfort, and with an overworked heart handicapped by the embarrassment of a displaced mediastinum. And the same care is wanted in fixing the limits of activity for these chronic cases where surgical treatment is not undertaken. They will not generally benefit by being taken past the stage of exercise represented by light gardening, nor is there any justification for making them short of breath.

The country is alive with schemes, some in an early stage, some already in working, for dealing with the tuberculous patients discharged improved from sanatoria. How are these old chronic fibroid cases going to fare? Their working capacity is often great, and their expectation of life indefinite. They can do a relatively large quantity of work, assuming it is work of the right kind and within their respiratory capacity, but they are not capable of sudden great exertion, and are most comfortable on a fairly sedentary job. It follows that in the laudable desire to get them open-air conditions we must not overlook their limitations. If we are going to send them to open-air colonies we must make provision for sedentary occupations, many of which are compatible with open-air conditions. They will certainly live longer and do more useful work under the light physical strain of sedentary employment than they would by going blue in the effort to get through the average day on a farm.

A CASE OF
BENCE-JONES'S ALBUMOSURIA WITH LYMPHOCYTIC LEUCOCYTHÆMIA.

BY HENRY L. HEIMANN, B.A. CAPE,
AND
C. BAWDEN WILSON, B.A. CANTAB.
With Note by
H. BATTY SHAW, M.D., F.R.C.P. LOND., F.R.C.S. ENG.,
PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

Note by Dr. BATTY SHAW.—The following case appears to be of special interest because of the association of leucocythæmia with Bence-Jones's albumosuria; presumably the marrow has shared with other tissues in producing the picture of leucocythæmia. If Bence-Jones's albumosuria were expressive of a pathological function of the marrow, then it should be more common in leucocythæmia, especially in the myelocytic form. It has not been my experience to meet with this coincidence of leucocythæmia and Bence-Jones's albumosuria before, nor is it referred to much in the literature on the subject. I can only therefore conclude that the association is purely an example of coincidence, or would be more frequently observed if greater care were taken in the examination of the urine in cases of leucocythæmia as was happily taken by Mr. Heimann and Mr. Wilson in this case.

The patient, a married woman aged 39, was admitted to University College Hospital, London, on July 22nd, 1918, under the care of Dr. Batty Shaw.

There was a history of "albuminuria," shortness of breath, and cough for 14 days, with blood-stained expectoration. She stated that in childhood she had had scarlet fever, measles, and whooping-cough, whilst for the last ten years she had suffered from anæmia. In August, 1917, her legs began to swell, but returned to their normal size on resting; she was unable to resume her occupation without the same condition recurring.

There was no swelling of the legs when she entered hospital; her complexion was waxy in colour and she looked wasted. The anterior abdominal wall was lax and there was a ventral hernia; the liver was palpable to a distance of three finger-breadths below the costal margin and an enlarged spleen extended two inches below the subcostal plane in the direction of the umbilicus. The heart was enlarged; there was a well-marked "blowing" systolic murmur in the mitral area, and this was conducted into the axilla. Nothing abnormal was found in the chest. No albumin was found in the urine, but on heating a flocculent precipitate appeared which largely disappeared on boiling.

Urine examination.—A detailed examination of the urine was made (H. L. H. and C. B. W.).

A 24-hours' specimen was filtered. The filtrate was clear and measured 1275 c.cm. in volume; the reaction was acid and the specific gravity was 1018.

A test-tube of urine was heated in a water-bath, and a slight precipitate appeared at 56° C., and on gradually raising the temperature it became heavier by increments up to 62° C., after which there appeared to be no more precipitation. The precipitate was filtered off and the filtrate heated. No more precipitation occurred, so it was concluded that precipitation was complete at 62° C.

On heating the urine to boiling point all the precipitate first formed redissolved, with the exception of a trace which disappeared on the addition of a few drops of acetic acid.

It was apparent that we were dealing with Bence-Jones's albumose, and the following confirmatory tests were made:—

To a test-tube of the specimen caustic soda and a few drops of copper sulphate were added, and a deep rose-red colour developed in the cold (biuret test).

Other tests for proteins:—A. Colour reactions: (1) Xantho-proteic, positive; (2) Millon's reagent, positive; (3) Molisch's test; positive; (4) the sulphur reaction was slight.

B. Precipitation reactions: (1) Ammonium sulphate, precipitate; (2) HCl (strong), precipitate; (3) ferric chloride, precipitate (solution in excess); (4) alcohol, precipitate; (5) picric acid, precipitate; (6) mercuric chloride, negative; (7) trichloracetic, negative.

All the above tests were confirmed in a solution of the purified albumose.

Further experiments were made with a specimen of urine and a saturated solution of ammonium sulphate.

It was found that on adding 8 c.cm. of ammonium sulphate solution to 10 c.cm. of urine an opalescence appeared. This was filtered off and a clear solution obtained. It was found that the filtrate gave no precipitate on adding more ammonium sulphate until a further 4·7 c.cm. of saturated solution had been added.

This process was repeated, and a series of definite precipitates was obtained for definite concentration of ammonium sulphate in solution. All these precipitates gave the biuret reaction for albumose.

This phenomenon, combined with the different increments obtained by coagulation, suggests that Bence-Jones's albumose is a complex of a number of albumoses.

Estimation of the contents of the urine was made by us, the patient being on a light fish and milk diet.

Total sulphates	1·3 g. H_2SO_4	Urea N	9·27 g.
Total N (Kjeldahl)	11·7 g.	Creatinine N	0·15 g.
Albumose N	1·09 g.	Ammonia N	0·61 g.
Unestimated N	0·32 g.	Uric acid N	0·26 g.

10·29 g.

This leaves 1·41 g. of N which is made up of albumose N, and other N products which we were unable to estimate.

Estimation of N in albumose.—It was found that mere precipitation by heat of the product and washing subsequently was unable to purify it.

Therefore 25 c.cm. of urine were taken; the albumose was coagulated and filtered off. It was then redissolved in boiling water and the precipitate obtained by cooling. This was thoroughly washed until no urea reaction was given by filtrate. No albumose was lost by this method, as was ascertained by testing the various filtrates.

The precipitate was then dried and weighed. The total albumose excreted per diem was found to be 35·7 g. The nitrogen content of albumose was found to be equivalent to 1·09 g. per diem. The albumose therefore contains 3 per cent. of nitrogen. We see the unestimated N amounted to 0·32 g. per diem.

A catheter specimen of urine was examined by the bacteriologist for organisms, and streptococci were found in large numbers and in pure culture. The strain was very virulent to rabbits. No casts were found in the urine.

Blood examination by F. H. Teale, M.D. Lond., F.R.C.P., clinical pathologist to University College Hospital:—

Wassermann reaction negative.

Total red cells, 2,860,000 per c.mm.; hæmoglobin, 59 per cent.; colour index, 0·9. Average size of red cells was increased. Numerous microcytes and macrocytes were present. There were a few normoblasts and gigantoblasts. There were poikilocytosis and vacuolation.

Total white cells, 8000 per c.mm.; lymphocytes, 63 per cent.; large lymphocytes, 8 per cent.; hyaline cells, 1 per cent.; polymorphonuclear cells, 27 per cent.; polymorpho-oxyphile cells, 0; myelocytes, 1 per cent.

The patient was under observation until August 16th, 1918, when she left the hospital. During that time she always had a slight evening temperature (average 99·6° F.). Her appetite was good, and she complained of always being hungry, whereas her weight, which was 6 st. 9 lb. on entering, never rose above 6 st. 11 lb. The urine was examined daily, and showed on each occasion the characteristics described above. We were unable to account for the presence of the streptococci in the urine, and she showed no signs of harbouring virulent pyogenic organisms in her bladder or upper urinary passages.

No deformities were found in the spine, nor were there any painful areas on any of the long bones. No enlargement of the lymph glands could be detected, and no metaplastic nodules were felt in any part of the body.

The condition of her heart had improved, and the cough had disappeared when the patient was discharged.

Diagnosis.—The outstanding points in the case seem to be the presence of the albumose in the urine, with a relative and total increase of small lymphocytes in the blood, and the absence of any signs of malignant growths. F. Parkes Weber and Ledingham describe five conditions of myeloma—i.e., lymphocytic, myeloblastic, myelocytic, erythroblastic, and plasmocytic.[1] F. G. Hopkins and H. Savory state[2] that this proteosuria may occur in three pathological conditions, myelomatosis, lymphoid hyperplasia of bone marrow and osteomalacia. We are inclined to regard the lymphocytic myeloma of the former observers as identical with the lymphoid hyperplasia of the bone marrow of the latter observers, and we believe the case described is one of this type, and gives the clinical picture according to the blood count of lymphocytic leucocythæmia. The enlargement of the liver and spleen also points to a hæmopoietic disease.

The secondary points of interest in this case were the heart disease, exemplified by the enlargement, the murmur, and the dropsy in the legs, together with the presence of streptococci in the urine. It is tempting to ascribe the heart lesion to an endocarditis of streptococcal origin, and to speculate whether a pyogenic organism of this type can affect the bone marrow and lead to the production of a lymphoid hyperplasia. We are convinced that this was a case of albumosuria from the beginning, and that the albumin reported in the urine earlier in the disease was really the proteose we found. It is possible, however, that the patient had true albuminuria during the periods of dropsy. We were unable to examine the urine and blood of her three children, who were at work and apparently healthy.

[1] Proc. Roy. Soc. Med., Path. Sec., ii., 1909.
[2] Journal of Physiology, xlii., 1911.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

SIX CASES OF PURULENT BRONCHO-PNEUMONIA ASSOCIATED WITH THE MENINGOCOCCUS.

BY J. A. GLOVER, M.D. CAMB., D.P.H.,
CAPTAIN, R.A.M.C.

DURING the examination of the contacts of a case of cerebro-spinal meningitis which occurred recently at the 4th London General Hospital, the following interesting facts were brought to light:—

The patient C., who subsequently developed cerebro-spinal fever, was admitted to hospital on Sept. 28th from Egypt with a long history of malaria and marked wasting. On Oct. 12th he was moved into another ward and placed in the next bed to a man, H. H. was a convalescent and one of the three survivors of a party of six men, all of whom had had severe purulent broncho-pneumonia and whose history will be dealt with later. H. had still a persistent cough.

Owing to the fireplace the beds of H. and C. were close together, although the ward was not crowded.

On Oct. 20th, after eight days of this close neighbourship, C. began vomiting and later developed other signs of meningitis.

On Oct. 24th, he being desperately ill, was lumbar punctured by me, turbid fluid with plenty of meningococci was obtained, and he has made a splendid recovery with antimeningococcus serum prepared for the Medical Research Committee, only two doses of the pooled I.-II. serum being required. The meningococcus in his naso-pharynx was Type I., that from the cerebro-spinal fluid not being grown.

Owing to the length of time C. had been in hospital it was probable that he had been infected there, and hearing of H.'s history of purulent bronchitis and persistent cough I took several swabs of him, all of which yielded a nearly pure culture of Type I. meningococcus.

The profuse growth from H.'s naso-pharynx contrasted strongly with the slight growth obtained from C.'s, from which the meningococcus was only recovered with difficulty after many swabs.

None of the other patients in C.'s ward was a carrier and the only staff contact who was positive was a sister who carried Type II., and who therefore obviously had neither infected nor been infected by either H. or C.

With the kind assistance of Dr. T. H. Jamieson I learnt, as stated above, that H. was one of the three survivors of a party of six patients transferred from Holborn Military Hospital, Mitcham, on Sept. 21st, all of whom had developed severe purulent broncho-pneumonia. Following up the other two survivors, I found that N., a great friend of H., but in another ward and on another floor, was also a "pure plate" carrier of Type I., and that the third survivor, J., who had been transferred to a convalescent hospital, was also carrying an almost pure culture of Type I.

All six of this party had been in hospital in Malta suffering from malaria acquired in Salonika. On August 29th they left there by hospital ship and arrived at Marseilles on Sept. 2nd, where they were 10 days under canvas in a general hospital. This they left on Friday, Sept. 13th, and after three days in a hospital train across France, crossed the channel via Southampton and arrived at Mitcham on Sept. 16th. On Sept. 18th all had high pyrexia, which in view of their history was considered malarial, and on Sept. 21st they were transferred to the Malaria Block of the 4th London General Hospital.

All now developed severe purulent broncho-pneumonia and three died, H., N., and J. only surviving after very dangerous illnesses.

Dr. Jamieson kindly gives me the following notes:—

In all cases there were marked dyspnœa and considerable cyanosis. In all cases the sputum was purulent and copious, and was *not* rusty or blood stained. Examination of the sputum showed pneumococci. In two cases there was diarrhœa, and in three albumin was present in the urine. The cause of death in each of the fatal cases was gradual cardiac failure. Two post-mortem examinations were done. Both showed broncho-pneumonia with quantities of purulent secretion in the bronchioles; in fact, the lungs, when cut into and held up, dripped pus. The sputum throughout had been noted as being very purulent. In none of the cases did any of the symptoms suggest meningitis.

We may now review our dates. H. was quite convalescent on Oct. 12th, when he was moved next to C. C.'s onset of cerebro-spinal fever was about Oct. 20th On Oct. 24th this was definitely diagnosed, and the same day H. was first swabbed and found to be a carrier. N. was found to be a carrier on Oct. 25th. J. on Oct. 26th, all nearly "pure plate" carriers of Type I. No other Type I. carriers were found among the contacts at either hospital.

In my opinion we may consider that C. was undoubtedly infected by H., and that in all probability the purulent broncho-pneumonia from which the six men suffered was due to a mixed infection of pneumococci or Pfeiffer's bacillus and Type I. meningococci. It was characterised by (1) high mortality, half the patients dying; (2) the extreme purulence and great abundance of the sputum; (3) the absence of rusty sputum or blood so common in the present epidemic of pneumonia. C.'s recovery was a dramatic proof of the potency of the Medical Research serum. Thirty-six hours after being apparently moribund he was demanding the morning paper, and he has only required two doses, although the first fluid showed many typical meningococci.

Efforts to isolate and agglutinate the meningococcus from H.'s sputum have failed, but it is to be remembered that this was only attempted more than a fortnight after convalescence was fully established.

LOCAL ANÆSTHESIA FOR EMPYEMAS.

BY C. W. MORRIS, M.B., B.S.DURH., M.R.C.S., L.R.C.P.,
TEMPORARY SURGEON COMMANDER, R.N.; CONSULTING ANÆSTHETIST, ROYAL NAVAL HOSPITAL, HASLAR;
AND
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TEMPORARY SURGEON LIEUTENANT, R.N.; ROYAL NAVAL HOSPITAL, HASLAR.

AT the present time when the influenza epidemic, with its sequela of pneumonia, is subsiding, and the virulence of the infection is lessening, a large number of the pneumonia cases, who in the earlier stages of the epidemic would have died, are developing empyemas. In view of the very serious condition of many of these patients the administration of a general anæsthetic for the removal of a rib is accompanied by great danger and likely to prove either fatal at the time of the operation or seriously to minimise the chances of recovery.

It is on account of these dangers that we have always employed local anæsthesia at the Royal Naval Hospital, Haslar, both before and during the present epidemic, and the experience gained in dealing with 150 cases, of which 85 occurred during the last six months, may prove of interest and use to those who are now faced with like cases.

We use a 0 5 per cent. solution of novocaine and sterile water, to which adrenalin chloride 1 in 1000 is added in the proportion of three drops to the fluid ounce, and the following is briefly our technique:—

The patient is placed in position on the table and the skin preparation made. Three inches of the rib over the site of the empyema are accurately outlined with a blue pencil, and the needle thrust perpendicularly through the skin at the posterior end of the marked area, injecting the solution at the same time, until the point touches the rib. The point is then directed down to the lower border and turned into the subcostal groove, and 5 c.cm. injected into the intercostal nerve.

Without withdrawing the needle the periosteum on the whole outer surface of this section of the rib, as far forward as can be reached through this puncture, is thoroughly infiltrated, beginning at the posterior end and working forward, paying especial attention to the two edges. The intercostal spaces above and below are injected and then the subcutaneous tissues and skin infiltrated. The needle is then withdrawn and inserted through the analgesic skin in the centre of the marked area, and the periosteum, intercostal spaces, and coverings of the rib infiltrated in a similar manner. One more puncture, again through the infiltrated skin, at the forward end of the marked portion of rib and the same process repeated will complete the infiltration. Should sufficiently long needles be used the whole area can be covered by two infiltrations, one at each end.

We find that to ensure the best results some 20c.cm. must be injected at each of the three punctures, and in stout patients larger quantities will be necessary. If the vertical incision rather than that along the rib should be preferred, we carry out the same infiltration, with the addition that we extend

the injection through the second puncture into the skin and subcutaneous tissues well over the intercostal spaces above and below. The infiltration is easy to carry out and only takes a few minutes; the patient feels only the one prick of the needle. The operation can be started immediately it is finished. It is necessary to emphasise the importance of using the rib shears with the utmost care, as any wrenching will give rise to pain at the costo-sternal junction.

On opening the pleural cavity there may be some discomfort, especially should the patient have a fit of coughing, which is sometimes the case in large empyemas.

In nearly all of the 85 cases operated upon since May the patients were suffering not only from empyema but had signs of active pneumonia in both lungs, and many had a blood pressure of well below 100 mm. Hg. Notwithstanding their serious condition no patients were lost at the operation nor did their behaviour during it give rise to further anxiety.

We claim that local anæsthesia for these patients gives greater safety and increases the chance of ultimate recovery.

INFLUENZA AND BLACKWATER FEVER.

BY SAMUEL SAMUEL, M.B., CH.B. LEEDS, M.R.C.S.,
LATE CAPTAIN, R.A.M.C.; HONORARY MEDICAL AND SURGICAL OFFICER, LEEDS JEWISH HOSPITAL.

MUCH has already been written in connexion with the present influenza epidemic, both in regard to its etiology and its complications. In the lay mind especially the present influenza has been looked upon by some individuals as a type of malaria, probably spread by the returning malarial soldier, and this, amongst other reasons, accounts, to a certain extent, for the great consumption of quinine, both as a prophylactic and as a curative drug.

The present influenza has been of a most virulent type, and the commonest of complications have been the various hæmorrhages which have included the various rashes, bleeding from certain organs—e.g., nose, uterus, stomach, lungs, &c. Though cases have occurred frequently where blood has appeared in the urine, it has chiefly been present when an acute nephritis has been a complication. I doubt, however, if many have experienced a case similar to the following, where the urine has appeared as blackwater, similar to what some of us who have seen active service in Macedonia have witnessed.

The patient, a male aged 45, previously quite well in health and never domiciled abroad, began on Monday, Nov. 25th, with typical influenza. He was treated with simple remedies such as spir. æther. nit. and simple alkalies, but no quinine was administered. His temperature began to subside on the third day, i.e., on the Wednesday. This same day he began to complain of violent colic in the epigastrium, which on the following day moved also to the flanks. Warm applications, simple warm-water enemata, and even small doses of morphia, had no effect in quieting the pain. On the Friday evening, whilst the pain was still severe, the patient passed quite an abnormally large quantity of urine as black as ink, with a reddish tinge showing just at the edge where the urine came in contact with the side of the chamber. An examination of the urine revealed the same features as are present in typical blackwater fever. On the Saturday morning the patient was seen in consultation with Lieutenant-Colonel G. W. Watson, who ordered tr. belladonnæ in 5 min. doses every three hours for the colic and warm applications to the flanks. The colic began to disappear almost with the second dose, and in the evening the patient was free from pain, though still passing the black urine. On the Sunday the black urine began to clear and to diminish in amount. The patient's conjunctivæ and skin then assumed a marked yellow tinge, which, however, disappeared gradually in the course of the next few days with the nightly dose of calomel gr. 1 and a morning seidlitz powder. Albumin and granular casts still persisted for about two days after the blackwater disappeared, when these also disappeared.

The patient to-day (Dec. 9th) is free from all symptoms, though weak and anæmic and earthy-looking. He is now allowed up for one hour a day. Just a week has now passed and there has so far been no recurrence of the blackwater, and the urine is quite clear and normal in all respects.

Leeds.

ROYAL SANITARY INSTITUTE.—The Henry Saxon Snell prize of 50 guineas for an essay containing the best suggestions for Improvements in Apparatus and Appliances for Dealing with House Refuse has been awarded, along with the bronze medal of the institute, to James Jackson, superintendent of the refuse disposal department at Birmingham.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE.

A MEETING of this section was held on Dec. 13th, when Dr. E. W. GOODALL, Lt.-Col., R.A.M.C., delivered his Presidential Address on

Enteric Fever in Flanders in 1914–1915.

He said that enteric fever was prevalent in Belgium at or about the time war broke out and cases occurred in England during the autumn of 1914 among Belgian refugees. The rapid advance of the Germans and the flight of the inhabitants were likely to assist the spread of the disease, the more so if the nature of the invaded country be considered. Belgium, west of a line drawn through Antwerp and Brussels, is a plain, intersected with rivers, mostly canalised, the water in which can flow but very slowly. This plain is, in places, thickly populated and highly cultivated, and human excreta are largely used for the purpose of fertilisation. The water is usually derived from shallow wells. Further, the Belgians, as a defensive measure, flooded the country to the north-east of Dixmude, the effect of which was to accentuate the stagnation. When trench warfare began, in November, 1914, the trenches were consequently in a very insanitary condition. At this time, of the four armies engaged in Flanders, the British alone was protected adequately by antityphoid inoculation. He gave evidence to show that by the end of November, 1914, there was in the Flanders area a considerable number of cases of enteric in the Belgian, French, and German armies, and probably amongst Belgian civilians, and a comparatively small number in the British Army. The outbreak began to assume epidemic proportions soon after the armies settled down to trench warfare.

An account was then given of the Friends' Ambulance Unit. Nearly all the members belonged to the Society of Friends, many being professional men, so that whatever line of work was taken up there was no difficulty in finding, amongst themselves, expert organisers and advisers. Part of a large building just outside Ypres was given to them, and here the local headquarters of the unit and the hospital were set up. Besides the treatment of patients in hospital the medical officers of the unit carried on an extensive outdoor visiting practice amongst the remaining inhabitants of Ypres and the surrounding villages not occupied by the enemy, and the hospital had been recognised by the Ypres Committee of Safety as the Ypres Civil Hospital. The authorities of the British Army enlisted the services of this unit as a friendly link between themselves and the Belgian civil authorities to help them in their campaign against the epidemic. The area, not occupied by the enemy, affected by the epidemic was about 31 miles long and 12 miles broad, stretching from Nieuport on the north to Ploegsteert on the south. The epidemic probably spread rapidly towards the end of December, 1914.

With regard to the number of cases information was limited, but it was probably very considerable; there must have been about 4000 cases under treatment daily during January and February, 1915, in the French military hospitals in Dunkirk and its neighbourhood, and the number in the Belgian Army must also have been considerable. One thousand cases (Belgian civilians) passed through the hospitals of the unit at Ypres and Poperinghe, and about 1000 more came to the knowledge of the officers of the unit, which were treated elsewhere. The British Army furnished comparatively few cases—only 827 up to May 22nd, 1915.

Character of the Cases.

The disease differed in several points from the types the speaker had seen in England during the previous 25 years. 1. The fever ran a very irregular course, the oscillations being frequent and extreme, so that the chart at the height of the disease resembled in many cases that of pyæmia or phthisis. Temperatures of 104° to 105° F. were by no means uncommon. 2. A considerable number of the cases exhibited pronounced nervous symptoms, coma or semi-coma, or restlessness and delirium. These symptoms did not pass off as the general condition improved and the temperature fell. The comatose cases did worse than the others; in such cases death occurred without recovery of consciousness,

though the temperature fell. He attributed the mental state to the harassing conditions under which the patients had been living before they became ill. 3. Clinical evidence showed that the intestinal lesions were by no means entensive or severe. Death was due either to cardiac failure, probably caused by myocarditis, or to hypostatic pneumonia.

Cases which he saw later among French soldiers were less severe, and conformed to the type he had been used to seeing in England. This he accounted for by the fact that the patients were well fed, many had been inoculated, and a large proportion were cases of paratyphoid. As soon as laboratory methods of diagnosis were employed it was found that a considerable number of cases were paratyphoid. Of 43 cases at the Queen Alexandra Hospital, Dunkirk, in which the blood cultures were positive, 16 were typhoid, 22 were paratyphoid A, 3 were paratyphoid B, and 2 were paratyphoid, but whether A or B was not ascertained. If to these cases were added those in which the results of the blood serum tests were taken as clinching the diagnosis, there were 43 cases of typhoid, 32 of paratyphoid A, 12 of paratyphoid B, and 2 of paratyphoid, ? A or B, so that 52 per cent. were paratyphoid.

This proportion was very different from that found amongst the Belgian civilians admitted to the Hôpital Elisabeth at Poperinghe. Out of 308 cases in which the clinical diagnosis was supplemented by positive blood cultures or serum tests, 245 were typhoid, 62 were paratyphoid B, and only 1 was paratyphoid A—that is, 20 per cent. were paratyphoid. Several reasons were given which might account for this difference, one of which was the fact that of the 102 cases in the Queen Alexandra Hospital 29 per cent. had not been inoculated, whilst of the 454 cases admitted to the Hôpital Elisabeth 92 per cent. had not been inoculated. The presence in any particular area of more or fewer cases of the three varieties must also be taken into account. It was generally believed that paratyphoid A was introduced by carriers among the troops, as it was very rare in Europe before the war, and the figures given indicated that the Belgian civilians were not exposed to the infection of paratyphoid A, but that the French soldiers were.

Of the 435 cases admitted during the febrile period to the Poperinghe Hospital 93, or 21 per cent. died, whilst of 102 cases admitted to the hospital at Dunkirk 10, or 9·8 per cent., died. The Poperinghe cases were of all ages and both sexes, but with a majority of females; the Dunkirk cases were all males, mostly from 30 to 40 years of age. The fatality rates for typhoid and paratyphoid in the two hospitals were also different. For the Hôpital Elisabeth they were as follows: Typhoid, 9·7 per cent.; paratyphoid, 19·2 per cent. For the Queen Alexandra Hospital: Typhoid, 20·9; paratyphoid, 2·1 per cent.

Preventive Measures.

The measures employed against the epidemic were: (1) those for providing for the sick; and (2) those for protecting the healthy. 1. The medical departments of the several armies dealt with the soldiers, and the Friends' Ambulance Unit chiefly with the civilians. Hospital accommodation was provided for those who had to be so treated. 2. As regards the measures adopted for preventing the spread of the epidemic by protecting the healthy, the authorities acted quickly and energetically. They were such as are usually taken in epidemics of this nature—viz., (*a*) the removal and isolation of the sick in hospitals; (*b*) the cleansing and disinfection of premises; and (*c*) the provision of a safe water-supply. The inoculation of the civil inhabitants of the infected areas with antityphoid vaccine was made obligatory by the Belgian authorities, those who refused inoculation being liable to be expelled from the zone occupied by the Allied Armies and treated as refugees. Enteric fever was made notifiable, omission to notify being punishable by fine or imprisonment. The following table of statistics was given of inoculation of the Belgian civil population by the Ambulance Unit from Feb. 5th, 1915, to May 31st, 1916:—

1915.	First.	Second.	Percentages of second inoculations.	Total.
Feb. 5th to 28th ...	4,890 ...	2,649 ...	(54·1) ...	7,539
March 1st to 31st ...	4,942 ...	4,576 ...	(92·5) ...	9,518
April 1st to 30th ...	1,010 ...	972 ...	(96·2) ...	1,982
	10,842	8,197	(75·6)	19,039
To end of July, 1915	14,836	11,375	(76·6)	26,211
To end of May, 1916 (total inoculations)				26,700

By the middle of March the epidemic was on the wane as far as the French Army was concerned, and by the beginning of the summer it was at an end, not only in the armies, but amongst the civilians. Colonel Goodall attached more importance to the effects produced by the usual sanitary measures than to the inoculations, because the inoculations were against *B. typhosus* and not against *B. paratyphosus A* and *B.* Now that the enemy had been driven from Belgium the civilian inhabitants would be returning in large numbers, and every effort should be made to prevent a fresh outbreak.

SECTION OF OTOLOGY.

A MEETING of this section was held on Nov. 15th, under the presidency of Mr. HUGH JONES, of Liverpool.

Acute Osteomyelitis of Temporal Bone.

Mr. HERBERT TILLEY showed a boy who had made a remarkable recovery from Acute Osteomyelitis of the Right Temporal Bone. The patient was admitted to hospital on account of acute suppurative otorrhœa of six weeks' duration, associated with pain, pyrexia, sleeplessness, and malaise. The roofs of the antrum and tympanum were found at the operation to have been destroyed by disease, the dura was replaced by a mass of granulation tissue. The wound was left open and dressings applied. During the following month the soft tissues in the temporal and mastoid regions became swollen and œdematous. At the second operation the squamous and mastoid portions of the temporal bone were freely exposed, and were found to be so softened by inflammation that large portions could be scraped away and removed by forceps. During the long convalescence herniæ cerebri occurred on three occasions in the original mastoid wound. With the exception of a small sequestrum the patient was now well. Acute spreading osteomyelitis of the temporal bone Mr. Tilley regarded as rare, and most of the cases were fatal. Probably the very wide removal of inflamed bone accounted for the successful issue in this case.

Mr. W. STUART-LOW spoke of the value in such cases of a wound-protecting shield, which permitted efficient drainage and obviated pressure on the wound edges.

Mr. HUNTER TOD described three similar cases, two of which were fatal. Usually the pulse was not rapid nor the temperature very high. The only hope in such cases was early recognition and the removal of as wide an area of bone as possible. He regarded it as a blood infection.

Dr. D. R. PATERSON (Cardiff) commented on the extreme rarity of osteomyelitis of the temporal bone as contrasted with that of the frontal.

Symmetrical Lupus Erythematosus.—Epithelioma of Helix.

Mr. STUART-LOW exhibited a case of extensive Symmetrical Lupus Erythematosus. The patient, a man aged 45, had had the skin condition ever since he could remember, but it had extended more rapidly during the last few years, especially on the scalp. A portion of the tissue was pronounced by Dr. Wyatt Wingrave to be epithelioma grafted on to lupus erythematosus.

Dr. H. J. BANKS-DAVIS referred to a case of Epithelioma of the Helix which he removed in 1914 without operating on the glands, and in which the patient still remained free of recurrence.

Double Facial Paralysis due to Bilateral Tuberculous Mastoiditis.

Mr. W. M. MOLLISON showed a child, aged 13 months, who had been the subject of the above condition. Otorrhœa began at the age of 6 months, and had been considerable ever since. The mastoid swelling and change in the face were very recent. A profuse foul discharge came from both meati. At the operation the mastoid process was found to be soft and necrotic, and a series of sequestra were removed with a sharp spoon. Six days later the other mastoid was operated upon and a similar condition disclosed.

Mr. HUNTER TOD raised the question of the source of the milk for this child, as this condition was often found to be due to infected milk.

Mr. STUART-LOW remarked on the rarity of the occasions when tubercle bacilli could be found in the discharge.

Dr. PERRY G. GOLDSMITH (Canadian A.M.C.) thought the term tuberculous was often applied somewhat loosely to these cases. The rapidity of the healing in this case he regarded as against it being tuberculous.

The PRESIDENT related the cases of twins, 10 months old, who, two months before he saw them, had suffered from

double otorrhœa, and then developed enlarged cervical glands. The source of the milk supplied was declared to be quite beyond suspicion; the cow was kept by a gentleman farmer, who was said to have had his herd regularly tested with tuberculin. A portion of the granulation and discharge injected into a guinea-pig produced tuberculosis. The medical officer traced the milk to a tuberculous cow in this model dairy.

Dr. W. H. KELSON thought the rapid healing of this case formed no argument against the condition being tuberculous; he had had very quick recovery in such cases, even when the disease was extensive. But these cases were apt to break down periodically.

Necrosis of Internal Ear.—Radical Mastoid Operation.

Mr. MOLLISON also showed a man, aged 60, who had recovered from Necrosis of the Internal Ear, causing Sequestration of the Labyrinth. He had had pain in the left ear for years, and for three months had suffered from headache and vertigo. There was a large polypus in the left meatus, with foul otorrhœa. On exposing the antrum all anatomical landmarks were absent, and a kind of trench surrounded the labyrinth; the labyrinth was loose and could be brought away whole. The condition was not tuberculous.

Dr. PATERSON raised the point as to what degree of bone removal in order to deliver the sequestrum was justifiable. In some cases he had contented himself with loosening under an anæsthetic and then leaving it alone. He always feared a connexion with the carotid canal, or an attachment of the inner part of the sequestrum to the auditory nerve.

Mr. J. F. O'MALLEY asked whether syphilis could be excluded, as it was unusual for sepsis to isolate the labyrinth in this way.

Dr. DUNDAS GRANT showed two cases in which the radical mastoid operation was performed for Cholesteatoma, and in which the matrix had been preserved six months and 14 years respectively after the operation.

Several members congratulated Dr. Grant on the excellent results.

A Case of Medico-Military Interest.

Mr. O'MALLEY showed a case of Chronic Middle-ear Suppuration in a young soldier, for the purpose of raising important points of medico-military interest. This man's left ear had been constantly discharging for over two years. There was no history of disease in childhood, but he had had pain in the mastoid for eight months, worse at night. For the purposes of a pension award, was it justifiable to state that the trouble began not more than two years ago? Assuming him to have been in the Army over two years, should his condition be attributed to (*a*) military service; or as (*b*) only aggravated by it; or as (*c*) not affected by it? He also asked whether a radical mastoid operation was positively indicated.

Dr. GOLDSMITH said there was no objective evidence in regard to the man's pain, and the patient knew he would be paid if his deafness had been due to military service, or if it came on since the commencement of the war. The course of the case had not been that of acute middle-ear suppuration. His condition was aggravated, but not caused by, war service. Probably the trouble would not be removed except by operation. The pain he, the speaker, regarded as largely psychic.

Dr. DUNDAS GRANT said it was unfortunate that it had been necessary to take men into the Army without examining at all closely into the condition of their ears; many now in the Army would not have been there if such examinations had been made. The man should be given the benefit of the doubt, and his statement that he was well before he entered the Army should be accepted. As he had one good ear and calcareous changes in the other, his disability for pension purposes should be assessed at 20 to 30 per cent. If there were well-marked cholesteatomatous products he thought operation would be justifiable.

Mr. STUART-LOW said cases which had had a discharge at any time should have been cautioned not to bathe. He did not doubt that this man's condition had been chronic for years. He favoured operation.

Mr. ALEX. SHARPE, Colonel, R.A.M.C., thought this man's condition was contracted in the Service and was aggravated by it, but was not attributable to it. He would put the disability at 15 per cent.

Other cases were also shown.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

THE quarterly meeting of this Association was held at 11, Chandos-street, London, W., on Nov. 26th, under the chairmanship, owing to the absence of the President through illness, of Dr. DAVID G. THOMSON, ex-President.

The CHAIRMAN announced, with regret, the death of Dr. John B. Chapin, of New York, an honorary member, who for many years had been regarded as the Nestor of American psychiatry. He was in his 89th year, and had to his credit 50 years of service in hospitals for mental disorders. He retired in the summer of 1911. He also deplored the death of Dr. William Reid, who for more than 25 years was superintendent of the Aberdeen Royal Asylum, during which long term of office he saw the institution reconstructed at a cost of £50,000, largely owing to his own efforts. Also, the Association had to regret the death of Captain Frank Oswald Spensley, from pneumonia. He had served as senior assistant medical officer of the Darenth Industrial Colony, Dartford. Further deaths were those of Dr. T. S. Logan, of the Bucks Asylum, Stone, from influenza, Dr. A. Hume Griffith, medical superintendent of Lingfield Epileptic Colony, and Dr. T. Herbert, assistant medical officer of the York City Asylum.

Dr. R. PERCY SMITH reported on the work of the Lebanon Mental Hospital during the war under the care of its medical superintendent, Dr. Watson Smith. As the Turks recognised the institution as a religious or philanthropic one it had not been molested; they had supplied the hospital with food, despite the starvation going on around in Syria.—The Secretary was asked to write a letter of congratulation from the Association to Dr. Smith on his work under trying circumstances.

The meeting then discussed the recommendations from the Report of the English Lunacy Legislation Subcommittee. These were proposed by the chairman of the committee, Dr. H. WOLSELEY-LEWIS, seconded by the secretary of the committee, Dr. R. H. COLE, and duly approved.

The Interdependence of the Sympathetic and Central Nervous Systems.

Dr. DAVID ORR and Dr. R. G. ROWS submitted a contribution on this subject, supplemented by numerous illustrations. In the class of cord lesions which formed the subject of their previous work insuperable difficulties were encountered against accepting a "general intoxication" theory without qualification. Presumably the poison concerned did not act unaided or indiscriminately, and there were reasons for surmising that the sympathetic nervous was, in all likelihood, the intermediary in determining the localisation of the lesions. Evidence of this view was now brought forward. It was important to remember that sympathetic action was dependent upon the supply of adrenalin. The sympathetic nervous system, the adrenal bodies, and all chromaffin tissue must be considered as one in relation to the blood vascular system, and chromaffin tissues yield adrenalin or a similar chemical substance, and effects produced by this are almost all such as are produced by the sympathetic system. The sympathetic system is intimately linked up with the central nervous system; it has no true autonomy, and there are anatomical paths which provide for a constant interaction between both. Stimuli must be constantly passing from the sympathetic to the central nervous system, as there are special sense organs in the viscera and a definite sensory afferent path, and they certainly exercise physiological effects. Dr. Orr and Dr. Rows set out the plea of von Monakow for the material basis of the sentiments and emotions, and stated, in conclusion, that it was apparent that in nervous diseases, especially in those concerning the cerebrum, it was necessary to study, in the future, not only the more prominent symptoms dependent upon disturbed function of the central organ but also the collateral symptoms arising from disturbance of all the peripheral organs intimately connected with it. The problem could not be solved by a narrower programme.

Dr. BEDFORD PIERCE expressed the hope that the subject would be brought up again, with full opportunity for discussion, and spoke of a case of melancholia on which the paper seemed to throw much light.

Dr. ROWS replied.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

Influenza.

A MEETING of this section was held on Nov. 15th, when Dr. G. PEACOCKE, the President, delivered his inaugural address on Influenza. It was, he thought, generally held that the causal organism was the *B. influenzæ*, though many held that some as yet undiscovered virus was responsible for the present epidemic. When uncomplicated, influenza did not often cause death, the high mortality of the present epidemic being almost entirely due to the presence of secondary infection with pneumococci and streptococci. The death-rate was not so formidable as was imagined—about 6 5 per cent. in his hospital practice and less than 2 per cent. in his private practice.

Symptoms.—Cyanosis was frequent with pulmonary complications, appearing early and persisting usually until death occurred. Laryngitis was extremely common. Delirium was often met with, and he had seen one case of mania. The temperature chart was often a fallacious guide, as severe cases often had only a moderate degree of pyrexia. An ominous sign was a fall of temperature without a corresponding fall in the pulse and respiratory rates. A moist and slightly furred tongue was a favourable sign, but if it were dry and thickly coated the chances of recovery were small. Vomiting was often distressing and alarming Slight albuminuria in the acute stage was common, but when severe the outlook was unfavourable. The pulmonary signs were varied—bronchitis or broncho-pneumonia was frequently present. A pulse rate of 80, with a temperature of 102° to 103° F. was not uncommon, and during convalescence the pulse often became very slow, sometimes even 40 per minute. Jaundice was sometimes present, a tendency to hæmorrhages was common, especially epistaxis. Tonsillitis was rare. Otitis media should be recognised as of frequent occurrence. He had seen no case of influenzal meningitis. Dr. Peacocke noted particularly the outstanding form of the disease, in which death occurs with dramatic suddenness.

Treatment.—He usually employed salicylate of quinine. Aspirin appeared to relieve the headache. The bowels should be kept free and sleep should be promoted; he preferred calomel as a purgative and trional or some preparation of opium for sleeplessness. Stimulants were usually required and should be given freely.

Captain JOHN SPEARES gave an account of the disease, with special reference to the post-mortem findings and vaccine treatment. He concluded (1) that the mass of evidence showed that the present pandemic was caused by a bacillus which morphologically and structurally resembled Pfeiffer's; (2) that the fatal secondary pneumonia was caused mainly by a streptococcus hæmolyticus, which was frequently associated with hæmorrhagic tendencies; (3) that there was conclusive evidence of acute nephritis and albuminuria in severe cases; (4) that probably a certain degree of immunity was conferred by prophylactic use of influenza vaccine, and that the use of the vaccine for this purpose was justifiable; (5) further experiments, duly controlled, were necessary to establish the utility of influenza vaccine for prophylaxis and early treatment.

In the course of the discussion Dr. J. H POLLOCK said that in his investigations at the Richmond Hospital on sputum, nasal discharge, empyema fluid, lung tissue, and heart's blood obtained post mortem, pneumococci or streptococci, or both, were always recoverable.

Professor E. J. MCWEENEY considered that the prevailing organisms were streptococci, pneumococci, and *Micrococcus catarrhalis*, these organisms being the cause of secondary pneumonias.

Dr. T. G MOORHEAD noted the occurrence of severe meningeal symptoms, particularly in children, and asked if the influenza bacillus had been found in the cerebro-spinal fluid in any cases. He had found the fluid under tension, but sterile. He noted the frequency of post-influenzal delirium and mania, and post-influenzal empyema.

Dr. W. M. CROFTON thought that the microbes producing the complications—viz., staphylococci, strepto-pneumococci, and Gram-negative cocci—might be a primary infection along with the influenza bacillus, but that more frequently the patient's own catarrh microbes became pathogenic when his resistance was lowered by the influenza bacillus.

Dr. W. D. O'KELLY said that the fact that a vaccine containing no influenza bacilli seemed to protect against the disease as well as a pure influenza vaccine, suggested that a filter-passer was at fault, which might perhaps be present in the various vaccines used.

Dr. G. E. NESBITT said that in judging the results of protective inoculation it was necessary to remember the curious variations in susceptibility.

Dr. F. KENNEDY CAHILL thought that "suggestion" might act in cases of preventive inoculation, and quoted the case of a patient who developed all the symptoms of influenza except a temperature 16 hours after an injection of 1 c.cm. of sterile water. In the present epidemic the absence of post-influenzal profound prostration was remarkable.

Dr. W. BOXWELL regarded the severe types as cases of profound septic intoxication. He was not satisfied as to the results of vaccine treatment, but thought wholesale vaccination in the middle of an epidemic was dangerous, as was also the wholesale vaccination of contacts in a household. The time for vaccination was in the interval of recurring epidemics, but as the immunity was short-lived the value of prophylaxis in influenza was largely discounted.

SOCIÉTÉ DE BIOLOGIE, PARIS.

THE following is a summary of some of the papers read at the meeting of the society held on Dec. 7th:—

RUBINSTEIN and RADOVLIEVITCH.—Sero-diagnosis of Syphilis.

Le complexe inactivant l'alexine dans la réaction de Wassermann peut être isolé par l'action de l'eau distillée sur le mélange sérum + antigène. Ce complexe agit spécifiquement dans le cas des sérums chauffés et non spécifiquement dans le cas des sérums non chauffés. La spécificité a été décelée uniquement par sa capacité de fixer l'alexine.

CH. NICOLLE and CH. LEBAILLY.—The Spirochæte of Infectious Icterus.

Le virus d'origine murine de l'Institut Pasteur de Tunis a fait en un an 70 passages par cobayes. Un cheval de onze mois a reçu dans les veines 44 inoculations de ce virus; son sérum est préventif contre le virus humain français (L. Martin et A. Pettit). Les souris inoculées avec le virus de passage, conservent ce virus sans réagir pendant cent jours au moins, ainsi que le démontre l'inoculation de leurs organes aux cobayes de contrôle. Il y a là un moyen commode de transport et de conservation du virus.

W. MESTREZAT and ROMME.—Chemical Criterion for Secondary Suture.

Les auteurs ont déterminé sur une soixantaine de plaies, le rapport: $100 \times \frac{NH^3}{NaCl}$ le numérateur exprimant l'azote titrable au formol, exprimé en ammoniaque, le numérateur, le chlorure de sodium des compresses de pansements secs *en place depuis quarante-huit heures*. Les valeurs de ce quotient ont toujours été inférieures à 10 lorsque les sutures secondaires tentées ont été suivies de *succès complets*. Des incidents variables se sont produits supérieurs à 10. Les auteurs voient dans la détermination de l'indice formol d'une plaie un moyen précis de juger de l'opportunité d'une suture secondaire.

F ALBERT.—Route of Absorption of Tetanus Toxin.

L'absorption par voie sanguine prédomine. C'est par cette voie que la toxine gagne les centres nerveux. L'absorption par voie nerveuse pure ne donne jamais qu'un tétanos local. L'injection préventive confère à l'homme un certain pouvoir antitoxique. L'injection soit tardive soit insuffisante, confère une immunité relative. Cette immunité peut se dissiper (tétanos tardif).

Sir E A. SHARPEY SCHAFER.—Functional Regeneration of the Vagus.

Les incitations nerveuses qui montent des alvéoles pulmonaires ne sont pas les seuls agents qui règlent le rythme normal de la respiration, car quand ces courants sont supprimés il s'établit bientôt un autre élément régulateur.

COMMISSION D'ALIMENTATION.—The Nitrogen Needs of the Body.

En supposant le régime mixte le minimum exigible est de un gramme d'albuminoïdes par jour et par kilogramme de poids.

THE LATE MR. W. J. STEPHENS.—The death occurred at Brighton on Dec. 18th, in his sixty-fourth year, of Mr. William John Stephens, who at one time was one of the best-known medical practitioners in the borough. Compelled by ill-health a few years ago to retire from practice, he had during the war identified himself with various kinds of war work. A King's College man, he took the diploma of L.R.C.P. Edin. in 1882, and he spent practically all his medical life at Brighton. For 18 years he held the office of police surgeon, and at the time of his death he was in partnership with Dr. C. E. Maguire and Dr. W. A. Bowring.

Reviews and Notices of Books.

Fibroids and Allied Tumours. (Myoma and Adenomyoma.) By CUTHBERT LOCKYER, M.D., B.S., F.R.C.P., F.R.C.S. With 316 illustrations, including 37 coloured plates. London: Macmillan and Co. 1918. Pp. 603. 63*s.* net.

Dr. Lockyer holds an established position as an authority on the pathology of the pelvic organs in the female. He has had ample opportunities largely owing to the goodwill and coöperation of his colleagues over many years, and he has made good use of the abundant material put in his way, as this very valuable work proves. The book is, in our opinion, an example of what a monograph should be—complete, well written, containing not only the results of the author's large experience but also the best of what others have written on the subject. In one respect, however, it is lacking, and that is in the omission of complete references. A book of this description appeals only to the advanced student or to the teacher, and the omission in many instances of references is, to the latter at any rate, a serious defect.

The book is divided into three parts: the first part deals with Myomata of the Uterus, the second with those interesting and uncommon tumours, the Adenomyomata, and the third with the various operations practised for Myomata.

The pathology of the myomata is particularly well described and illustrated; indeed, one of the most striking features of the work is the lavish use of illustrations, both plain and coloured. Many of the latter are of great beauty. As might be expected, a good deal of space is devoted to a consideration of the various secondary changes in myomata, especially the commonest of all, hyaline degeneration. The author points out that red degeneration has attracted an amount of attention altogether out of proportion to its importance, and, as he says, the colour of the degenerating tumour is in most cases quite a side issue. Dr. Lockyer has no doubt about the occurrence of a myo-arcoma, and the number of pathologists who would deny this at the present time must be very small. We cannot agree with the statement that the presence of myomata is a relative cause of sterility. Surely in most women the sterility precedes its development and is rather the probable cause of the myoma. As the author a little further on points out, it is spinsters and sterile wives who suffer from myomata most commonly, and their sterility may well play a part in the etiology of these new growths. If we accept this view, then, the fact that interstitial tumours appear to delay conception is not difficult to explain. We notice a slight error on page 153. In the description of Dr. H. R. Spencer's case myomectomy "during delivery" should read "before delivery." It is interesting to note that the author's experience does not lead him to support at all strongly the view put forward by Bland Sutton that the excessive uterine hæmorrhage in the case of fib oid tumours is associated with septic changes in the endometrium. In the most virulent cases of septic endometritis seen in cases of puerperal fever hæmorrhage is certainly not a symptom. The author, we are glad to see, is quite clear that there is no such thing as a myoma heart, apart from the changes due to the anæmia caused by the hæmorrhage.

The section on the diagnosis of the myomata is very helpful, and an interesting case is recorded of a cystic submucous myoma mistaken for pregnancy. In view of the prominence which has been given of late years to the use of X rays and radium in the treatment of myomata of the uterus, a considerable amount of space is devoted to these methods. On the whole the author is not very enthusiastic but, as he admits, his personal experience is not large. The evolution of the operation of hysterectomy from a procedure with a mortality of 30 to 40 per cent. to one of 2 to 3 per cent. is one of the most interesting chapters in surgery, and the author does well to give a short résumé of the history of the operation. On the vexed question of the superiority of total hysterectomy to supravaginal amputation, Dr Lockyer states that he now removes the whole uterus as a routine, but for spinsters and elderly married nulliparæ he thinks the supravaginal operation may well be retained.

Part II. deals with that curious and perplexing group of tumours, the adenomyomata, on which Dr. Lockyer has a great deal to say. Indeed, were it not that in this country these growths have not attracted the attention they deserve, we might regard the division of the subject as somewhat unequal when we find no less than nearly 180 pages devoted to this rare group of tumours. After a very interesting review of the main theories as to their origin, the author deals with their classification, and suggests that they may be considered under the two main groups of intra- and extra-uterine myomata. A great deal of information is given about the latter very interesting group, including adenomyomata of the round ligament, broad ligament, ovarian ligament, of the recto-genital space, and adenomyomata of the alimentary tract. This section is a most valuable one, forming the best critical review of this subject so far written in this country.

The third part of the book contains a full account of the various operations practised in the treatment of myomata. A useful section is included dealing with the after complications which may occur.

This book, in spite of its cost, will be indispensable to anyone engaged in the teaching of gynæcology; it will increase the author's already high reputation as a clinical pathologist, and it is a production on which we can most heartily congratulate him. The publishers are also to be congratulated for their part, as are the artists, for the beautiful illustrations which have been well reproduced.

The Life and Letters of Joseph Black, M.D. By Sir WILLIAM RAMSAY, K.C.B., F.R.S. Together with an Introduction dealing with the Life and Work of Sir William Ramsay, by F. G. DONNAN, F.R.S. London: Constable and Co. 1918. Pp. 148. 6*s.* 6*d.*

THE real artist and the genuine scientific worker may be said to belong to that class the members of which Lucretius designated as "divinitus invenientes"—i.e., as attaining what they sought by a kind of divine inspiration. This is obvious to most minds in the case of a musician, a painter, an architect, or sculptor. The works of Bach, Leonardo, Giotto, or of those nameless craftsmen who reared Rheims and the other great cathedrals in thirteenth-century France, stand out clearly to ear or eye. But the patient work of the chemist or the physicist is mostly hidden and in many instances stands in the same relation to its application as the acorn does to the oak. For no one who did not know could conceive on looking at an oak that it had sprung from an acorn, and likewise no one seeing the present-day applications of electrical power could imagine that they are all practically due to the fact that Faraday discovered that an electric current is induced in a conductor if it be moved across the poles of a magnet so as to cut the lines of magnetic force. Mendeléeff's Periodic Law and the gaps therein, together with the work of Lord Rayleigh and Ramsay on the inert gases, are further examples of the "divinitus invenientes." It is most appropriate therefore that Ramsay, the patient and accurate worker, should write an account of his great predecessor Black, to whose tireless, careful researches chemistry and physics owe such a debt. Moreover, Ramsay and Black were both educated at the same school of learning—namely, Glasgow College.

Sir William Ramsay has given us a charming biography of Black, illustrated with many extracts from his letters, with pictures of his contemporaries, and with at least one anecdote of an incident which occurred in the Senate Hall of Glasgow College during an official banquet.

"One of the guests was struck by the pale face of his neighbour, who appeared to be asleep—no extraordinary circumstance. 'What ails Drumsheugh?' he asked the man beside him, 'he's looking gey gash.' ''Sh man,' said he, 'he's been wi' his Maker thae twa hours.'"

Black's claim to immortality rests principally upon two researches, those dealing with "fixed air"—i.e., carbon dioxide—and those dealing with latent heat; in fact, he was the discoverer of both the gas and the condition. It is a curious instance of the irony of history that the incentive of Black's research was the desire to discover a mild alkali for the cure of calculus in the bladder, and that this desire was fostered by the Government having given a quack £1000 for the prescription of a medicine for the same.

We have no need to describe Black's patient and masterly investigation, together with his "proof that the change of a complex compound to simpler compounds, and the building up of a complex compound from simpler ones, can be followed successfully by the use of the balance"; but everyone who is interested in the progress of human thought should read Sir William Ramsay's charming account thereof.

Black died in 1799 in his seventy-first year; his passing was in accordance with his whole life, perfectly quiet and unembarrassed:—

"Being at table with his usual fare, some bread, a few prunes, and a measured quantity of milk diluted with water, and having the cup in his hand when the last stroke of his pulse was to be given, he set it down on his knees which were joined together, he kept it steady with his hand, in the manner of a person perfectly at ease; and in this attitude expired without spilling a drop, and without a writhe in his countenance; as if an experiment had been required to show to his friends the facility with which he departed."

Married Love: A New Contribution to the Solution of Sex Difficulties. A Book for Married Couples. By Dr. MARIE STOPES. With a Preface by Dr. JESSIE MURRAY and Some Striking Letters. London: A. C. Fifield. 1918. 5*s*.

THIS is an extremely sensible little book; it deals in the most intimate way with normal sexual life, and by sheer frankness remains decent. Of the things which are commonly accepted as sound physiology we need only say that they are also things which thousands of people would be the happier for knowing, though they cannot be made part of any public syllabus of secondary education. Nor can parents, guardians, or older friends be commonly regarded as the proper sources of such information—some will not possess it, still more would resent the mentor's task, and more again, we believe, would be quite unable to impart it. This is to say that the book is really needed as a public adviser.

The fourth chapter and the fifth, the two which deal absolutely with the sexual act, contain the essential message of the author, which may be summed up by adopting her own words, that the act is, or should be, a triple consummation, symbolising spiritual union, giving intense pleasure, and originating new life by fusion. The fourth chapter, entitled "The Fundamental Pulse," gives the evidence upon which the author has erected simple curves indicating the normal dates of the upwelling of natural desire in women in relation to the dates of menstruation, and it is with these postulates in mind that the fifth chapter, "Mutual Adjustment," must be read. That such rhythm is present in the usual woman's sexual life is well known to medical men, and we believe that the author's curves represent the physiological facts, though, as Dr. Jessie Murray says in her prefatory note, further observation is required to support the detailed theories.

LIBRARY TABLE.

Medical Annual for 1918. Bristol: John Wright and Sons, Ltd. Pp. 716. 10*s*. net.—Notwithstanding the difficulties with which its production is beset owing to the exigencies of military service, the *Medical Annual* of 1918 fully reaches the high standard set by the editor and publisher in previous years. The treatment of war conditions occupies a fair proportion of the volume, Deputy Surgeon-General A. G. Wildey, R.N., being responsible for an account of the treatment of wounds, the results of which still remain. Of special interest is Mr. W. I. de Courcy Wheeler's account of the work of the orthopædic centres under the general supervision of Sir Robert Jones. Mr. W. H. Dolamore contributes a well-illustrated description of the treatment of gunshot injuries of the jaws and face, showing the triumph of plastic surgery over unsightly deformity and functional disability. Malingering is dealt with by Mr. A. Bassett Jones and Mr. R. Ll. J. Llewellyn. The contribution of Dr. Carey F. Coombs on diseases of the heart is directed against the very prevalent mistake of attaching too great importance to auscultatory phenomena. In his experience numbers of men have been rejected from enlistment or recommended for invaliding out of the Army on no surer ground than the presence of an unimportant and often transitory murmur. Two new features add to the utility of the volume as a book of reference—the addition of a list of contributions to the name of each contributor, and an introduction by the editor consisting of a review of the year's work. This Annual should be in the hands of every member of the profession who wishes to keep abreast of medical knowledge.

Musings of a Medico. By KENNETH ROGERS, M.D. Lond. London: Erskine Macdonald, Ltd. Pp. 70. 3*s*. 6*d*. net.—Dr. Kenneth Rogers's little book of verse is divided into three parts; general verses, verses suggested by the war, and sonnets, closing with half a dozen pieces of irregular shape. He has put his more ambitious work into the sonnets, but of course it is exactly in the sonnets that the craftsman must expect to receive the severest inspection, and we feel that Dr. Rogers succeeds best in humbler flights. "The Lament of an Old Buffer" or, "On Man, Bees, and Flowers," latter being suggested in part by M. Maeterlinck's "L'Intelligence des Fleurs," and the rhyme of "The Dragon Fly" are all metrical exercises to which considerable feeling has gone. The little book is notable for the author's love of flowers.

Casting out Fear. By FLORA BIGELOW GUEST. Second edition. London: John Lane. 1918. Pp. 94. 3*s*. 6*d*.—Beginning with the paralysing effect of fear in general on all useful human activities, the author devotes 22 short chapters to particular fears, from the fear of heredity to the fear of death. Her epilogue runs:

> Let us cast out all Fear.
> Let the sun in at our windows.
> Let the sun into our souls.

And, whether consciously or not, she has adopted the method of the psycho-analyst to achieve this desirable result. She analyses in simple and striking language the genesis of phobias, and without making any claim to specialist knowledge contrives to say many helpful things—Chapter IV., on Educating Children in Fear, is very apposite. At a time when fear is being increasingly recognised as a motive in human conduct, we commend Mrs. Guest's little book to thoughtful study.

Home Nursing. Arranged According to the Revised Syllabus of the St. John Ambulance Association. London: St. John's Gate, Clerkenwell. Pp. 272. 1*s*. 6*d*.—This little book has been compiled by a committee from a manuscript written at the request of the St. John Ambulance Association by Miss Heather-Bigg, R.R.C., matron of Charing Cross Hospital. The arrangement of the manual is similar to that of the First Aid Manual, each chapter being followed by questions, with the pages indicated on which the answers may be found; an excellent method for enabling the student to revise and check knowledge. Beginning with a summary of the qualifications of a nurse, just so much physiology as is needful is given, followed by a succinct account of the duties of a home nurse, technical terms being sparingly used, while those absolutely necessary are included in a glossary. The avowed objects of the manual are: (1) to serve as a guide to a course of study directed by a medical man or trained nurse; and (2) to form a book of reference for those who have obtained home nursing certificates and are called upon to undertake the care of a patient where trained nursing is unobtainable, or where the illness is so slight that a professional nurse is unnecessary. These objects are well met in "Home Nursing."

JOURNALS.

The American Review of Tuberculosis. Baltimore: National Association for the Study and Prevention of Tuberculosis. 55 cents.—The September number contains several interesting papers on the war-time problems of tuberculosis in the United States of America, in Canada, and in France. Dr. George E. Bushnell reviews the results of the National Tuberculosis Association's programme, adopted by the Surgeon-General, for re-examining the American Army for tuberculosis. Nearly 450 physicians were engaged on this task, and about 10,000 men were found to be tuberculous within a month or two of enlisting. By eliminating these men, who would otherwise have become chargeable to the State, these examinations may be said to have saved $50,000,000 of public money. This calculation suggests that the interests of the State and the individual are diametrically opposed. A saner and more generous view is reflected in the Surgeon-General's statement, published in the Official Bulletin, to the effect that the soldier, disabled on duty, shall not be discharged before as complete recovery as possible has been effected. Dr. Bushnell draws attention to the great difficulty of distinguishing pulmonary tuberculosis from the present serious epidemic of hæmolytic streptococcal bronchitis and broncho-pneumonia. The clinical picture is, he says, exceedingly similar to that of pulmonary tuberculosis. Hence the order that no soldier shall be discharged for pulmonary tuberculosis unless tubercle bacilli have been found in the sputum. According to Dr. Bushnell, there is a movement on foot in the United States for standardisation of treatment, special courses of instruction being provided for medical men. These courses, it is hoped, will largely prevent contradictory instructions being given to the patient as he passes from one hospital to another. Dr. Bushnell does not say how such a notorious bone of contention as tuberculin treatment is to be fitted into the scheme of standardised therapy.

THE LANCET.

LONDON: SATURDAY, DECEMBER 28, 1918.

State Organised Pharmacological Research.

OUR attention has been drawn to a movement begun by the Government of Bombay in the direction of establishing a pharmacological laboratory and research institute for the investigation of drugs, and more particularly the indigenous drugs of India. A committee has been formed, with Lieutenant-Colonel A. STREET, M.B., F.R.C.S., I.M.S., as its chairman. The committee is to inquire what pharmacological research is being done in other parts of India, so that developments in Bombay may be coördinated, so far as is possible, with similar efforts elsewhere; and the committee is further asked to obtain information as to what is being done in the direction of pharmacological research in this country. The inquiry is opportune in a big drug-producing country like India, but, more than that, it raises the suggestion which might well receive serious consideration at home—the desirability of organising and establishing a State controlled laboratory for pharmacological research in the motherland.

We are under the impression that so far this important branch of scientific work has mainly been undertaken by private enterprise and by our great leading houses of pharmacy and chemical manufacture—at considerable cost. Certain University laboratories have, it is true, also undertaken analytical work, but not on any large scale. Very valuable work has thus been done, as the columns of the Chemical Society's Journal and those of the *Pharmaceutical Journal* show, and we have recorded the more important departures as they occurred, but clearly the scope of such work would be considerably widened if a reference could be made to a State pharmacological department. The Pharmaceutical Society, we know, maintains a school of pharmacy, which is under the direction of Professor H. L. SMITH, who occupies the chair of chemistry, and Professor H. G. GREENISH, who is responsible for the department of pharmaceutics; and valuable communications from the pharmacy research laboratory of the society appear from time to time in the columns of its official journal. We may refer to one article which appears in the last number of the *Pharmaceutical Journal* as a specimen of pharmacological research from this laboratory. It comes as a sequel to a note in our own columns on the use by the natives in the Central Transvaal of croton bark as a remedy for bilious malarial fever.[1] We know also of the existence of a scientific and technical department of the Imperial Institute, which has doubtless carried out investigations of national importance. This work, however, relates chiefly to the raw materials produced in our colonies in regard to their composition and utilisation, and the object is rather to give advice respecting industrial development and tropical agriculture. When the examination of raw drug materials is undertaken by this department, it would appear from the published reports that the references have been chiefly to the commercial development of certain colonial products, to the encouragement of their cultivation, and to other matters which do not call for pharmacological investigation.

In all schemes of research organised and controlled by the State the well-equipped pharmacological laboratory should take a place, and here special facilities should be afforded for bringing to light the medicinal value of raw materials. It is for a State department of this kind to take up a branch of research calculated to advance in general the pharmacology of drugs. So far as we are aware, no such department exists or ever has existed, and our knowledge of the essentials of plants, roots, barks, and so forth, used in medicine, has been due to independent research undertaken by the private individual. The separation and recognition of definite principles—for example, those in opium, nux vomica, cinchona, ipecacuanha—occur as a valuable record of the voluntary work of the medical man, the analyst and pharmacist acting in a private capacity. Such a position of things has narrowed the scope of pharmacological investigation in the past, and what is wanted in the future is a court of reference which can be trusted to take up the important issues arising when new remedies are announced. Moreover, such an institution should help in the work of establishing a relation between physiological action and chemical constitution and remove much empiricism from medical treatment.

[1] THE LANCET, Sept. 30th, 1899, p. 873.

King Edward's Hospital Fund for London.

AT a meeting of the Governors and General Council of the King Edward's Hospital Fund for London, called for the purpose of awarding the grants for the present year to hospitals, convalescent homes, and sanatoriums, Lord REVELSTOKE, in his capacity as treasurer, had the pleasurable duty of stating that the total receipts for 1918, up to, and including, the first week in December, amounted to £174,531, all expenses having been deducted, and the contribution from the League of Mercy not being added. Sir WILLIAM COLLINS, in making the annual statement on behalf of the League, reminded the meeting that during its 20 years of existence it had contributed to the voluntary hospitals in and around London £305,280. The figures given by Lord REVELSTOKE showed that the Fund had with its bankers, or at short call, sufficient money to meet the whole of the sum which it had been decided to distribute for the year 1918, amounting in all to £200,000. This is a notable achievement.

The report of the Distribution Committee, presented by Sir WILLIAM CHURCH, stated that the sum of £190,000 was to be distributed among London Hospitals, 103 in number, the remaining £10,000

being allocated to various Consumption Sanatoriums —£7825, and Convalescent Homes—£2175. The £190,000 destined for hospitals is £9000 in excess of the sum distributed in 1917, £27,500 in excess of that distributed in 1916, and £40,500 in excess of that distributed in 1913, the year before the war, although the buying power of the total has doubtless diminished during the same time. Of the total distributed over £160,000 is being applied in the form of grants to maintenance, leaving £29,750 as capital grants. Of these capital grants £10,100 is being employed in reduction of capital liabilities incurred before the war, £15,500 has been ear-marked for schemes of improvement, and the remainder represents the sums sanctioned for schemes of extreme urgency during the war. While the war was proceeding the Distribution Committee discouraged the issue of public appeals in aid of schemes which were not of extreme urgency, but in 1917 some capital grants were sanctioned in aid of deferred schemes, and early this year the Committee was announced to be ready to consider proposals for the immediate issue of appeals for post-war schemes on certain conditions—the main one of which was that in such appeals it should be clearly stated that the contributions received in response might be used either for building or for endowment. In this way hospitals would not be committed in advance to extensions which might later be found inadvisable. As a matter of fact, if all the schemes of extension which have come before the Fund were to materialise the available accommodation of the voluntary hospitals of London would be increased by no less than 1750 beds. It is quite clear that if any increase of this sort is contemplated the whole question should be considered from the point of view of the total needs of the metropolitan population and the geographical position of the institutions. The value of the work of the Fund is especially shown in its readiness to look at the voluntary hospitals of London as one public service and not as a congeries of rival charities.

The report of the Distribution Committee announces also the receipt of proposals for the amalgamation of University College Hospital and the Royal Ear Hospital, whereby the latter, which has been closed during the war, will be reopened as a special department of the large general institution. The Distribution Committee is supporting the working out of this scheme by grants. This amalgamation, following on that of the Hospital for Diseases of the Throat, Golden-square, with the London Throat Hospital reduces the number of ear, nose, and throat hospitals applying for a grant from five to three, of which only two are now on the books of the Fund. This is another indication of the way in which the Fund desires to bring order into hospital service for the vast London population by preventing overlapping of energies; but of course the process of fusing hospitals, general or special, with each other introduces the question of selecting the honorary staffs. We trust that those responsible for the management of King Edward's Fund will bear in mind the real difficulty that often underlies the position.

Annotations.

"Ne quid nimis."

LETHARGIC ENCEPHALITIS AND POLIOMYELITIS

THE difficulty of calling by an intelligible name such diseases as lethargic encephalitis and anterior poliomyelitis when the morbid agent is unknown and the morbid lesions are so various must not obscure the fact that a stage of useful knowledge has been reached in regard to the two diseases and their relations. In his lecture on lethargic encephalitis delivered before the Medical Society of London, which appeared in our issue of Dec. 21st, Dr. Farquhar Buzzard drew some general conclusions with regard to the recent epidemic. He directed attention to the fact that in the case of the analogous disease, acute poliomyelitis, the profession as a whole has tended to take too limited a view. In this it has followed the course of the history of the disease, in which our knowledge was for a long time based upon late examination of sporadic cases. It was not until epidemics occurred that attention was directed sufficiently to the protean character of the disease, due to the very variable localisation of the morbid process. Because the most common site was in the spinal cord and the most vulnerable elements the cells of the anterior horns the disease received the name "anterior poliomyelitis," and this stereotyped our conception of it. Dr. Buzzard has rendered a service by warning against a similar limitation of view in the case of lethargic encephalitis. This disease presents many points of similarity to acute poliomyelitis, but is "undoubtedly an entirely different disease." The form in which it was first observed was characterised by lethargy, asthenia, and oculo-motor paralysis; a second group of cases present the features of acute paralysis agitans. Dr. Buzzard describes a third group in which "the force of the inflammation was spent upon the cerebral cortex," with resultant Jacksonian movements and consecutive paralysis. In different cases the distribution of the lesions may be very various, and no doubt other types of case will be described later. The number of cases recorded in the present epidemic has been comparatively small, and they have occurred over a wide area, as shown in the note on the distribution of the disease by Lieutenant-Colonel S. P. James in the same issue of THE LANCET. It is probable that many other cases have occurred which have not been recognised as such, because they did not conform in type with the variety of the disease which was first described, and that later an "abortive" form of lethargic encephalitis may be established, as has been done by Wickmann in the case of poliomyelitis. Dr. Buzzard suggests that some sporadic cases of encephalitis lethargica have previously been diagnosed as cerebral thrombosis or hæmorrhage; he points out that microscopical examination is frequently the only method of differentiating between the two, the naked eye appearances being indistinguishable. This would explain those cases of "cerebral thrombosis" in which the Wassermann reaction is negative and the vascular system apparently healthy. Unfortunately, our ignorance of the causal agent is so complete that but little help in treatment is afforded by such a differentiation, beyond confirming our belief that the cause is one associated with a profound toxæmia against which general measures can be taken.

TROPICAL DISEASES IN THE BALKANIC WAR ZONE.

IN his paper read before the Royal Microscopical Society on Dec. 18th, Dr. Aldo Castellani, Lieutenant-Colonel, Italian A.M.C., described the tropical diseases commonly met with in the Balkanic zone during the war. Of these, he said, the most important and the commonest was malaria, which had often taken on a malignant character and had given endless trouble by simulating many other diseases. Only a routine blood examination can exclude errors in diagnosis. Next to malaria the dysenteries, amœbic and bacillary, were the commonest affections. Enteritis due to flagellates had occurred, and more rarely a form with a ciliate infection. Coccidiosis was also observed. Cholera and paracholera had been rare, although a choleraic type of bacterial dysentery had been observed, and a form of diarrhœa was seen in starving Serbian soldiers during the Albanian retreat which closely resembled the famine diarrhœa of India. Camp jaundice (*Icterus castrensis*) had been common. Dr. Castellani distinguishes two varieties: (1) a very severe type (*gravis*), hæmorrhagic, with high fever lasting 10 to 12 days, and occasionally relapsing—this is true Weil's disease, and fortunately rare; (2) the common mild type (*levis*), often afebrile, but probably in many cases spirochætic in origin, like the severe form. Fevers of the enteric group, fairly frequent in the Balkans, had not during the last year assumed epidemic type. Paratyphoid A and B were in certain districts more frequently met with than true typhoid. Fevers resembling paratyphoid but due to intermediate germs had also been noted. Colonel Castellani and G. A. Lurie found in some cases the *Bacillus colombensis* as causal agent. Not infrequently mixed infections were found in all the three possible combinations—viz., T.A., T.B., and A.B.; while two cases of triple infection, T.A.B., had been confirmed by hæmocultures. The method of combined vaccination devised by Dr. Castellani had given, he thought, good results, and the Serbian Army officially adopted a tetravaccine, T.A.B. + cholera. Malta fever, rare in Macedonia itself and the interior of the zone, was more frequently met with on the coast and in the adjacent islands. Kala-azar did not occur in Balkan adults, but many cases of the infantile type were seen in certain islands of the Adriatic and Ægean seas. Relapsing fever was common, and in its treatment the best results had been obtained by the combined use of salvarsan and tartar emetic. At the moment, he said, typhus exanthematicus was very rare, in striking contrast to the terrible epidemic which raged in 1914–15. Trench fever was occasionally met with in both the types described in France. Pappataci fever was extremely common in certain parts of the Balkans, especially in the late summer and early autumn. Broncho-mycosis and broncho-spirochætosis were far from rare. Pellagra was also quite common in several districts in Macedonia. Of the tropical diseases of rarer occurrence Dr. Castellani instanced blackwater fever, filariasis, leprosy, sprue, intestinal myiasis, mycotic, spirochætic, and flagellate urethritis. Certain tropical skin diseases of frequent occurrence gave rise to much discomfort in summer, and were often wrongly diagnosed. Such were dermatitis interdigitalis epidermophytica, or "mango toe"; tinea cruris, or "dhobie itch"; prickly heat; and various types of tropical pyosis, such as Mansoni and discoides. In 1915 Dr. Castellani saw among Macedonian peasants cases of ulcus tropicum, Oriental sore, ulcus infantum, blastomycosis, sporotrichosis, and acladiosis, and also numerous cases of trichomycosis axillaris flava, nigra, et rubra, of intertrigo saccharomycetica, and various other hyphomycetic affections. He had also reported two cases of Madura foot, two of keratoma plantare sulcatum, and one (typical) of ainhum. Dr. Castellani concluded with a strong plea for the routine microscopical examinations in all patients. The wealth of diagnostic problems among the conditions which he has described makes such a plea eminently reasonable.

AUTOTHERAPY IN INFLUENZA.

Dr. Luigi Meille draws attention in a recent issue of *Il Policlinico* (Practical Section, Nov. 3rd, 1918) to a method of introducing into the organism of a patient suffering from a severe form of influenza a non-heterogeneous serum which presumably contains the antibodies or antitoxins of the antigen or toxin which produces the disease, and which, beyond its own antitoxic properties, would also act as a producer of fresh antitoxins. The technique is extremely simple. The veins at the bend of the elbow having been made prominent by the application of an elastic ligature, the needle of a sterilised syringe of 10 c.cm. capacity with the piston down is introduced into one of them and the blood allowed to push back the piston and flow into the syringe. An amount of 20 or 30 c.cm. thus obtained by repeatedly detaching the syringe from the needle is emptied into a sterilised test-tube, which is then plugged with cotton-wool and covered with guttapercha. By keeping the test-tube in a slanting position for 12 hours the serum separates and 1 to 2 c.cm. are aspirated by a syringe and injected into the subcutaneous tissue of the patient. No local reaction follows, but after from three to four hours a slight febrile reaction may occur, which soon subsides without leaving any after-effects; serum disease is never observed. Dr. Meille states that the action of the serum is quickly shown by an improvement in the course of the disease; the pulse becomes stronger, cyanosis less marked, and delirium ceases. Autoserotherapy has no specific action upon complications, except by improving the general condition of the patient and favourably influencing the course of the disease.

BENJAMIN RUSH.

THE services of Benjamin Rush to American education have been well brought out by Dr. Harry G. Good, Ph.D., of Bluffton College, Berne, Indiana. At last justice has been done to the non-medical side of his life. Not without reason did Rush's friend, J. C. Lettsom, call him the American Sydenham; but he was more than physician—he was author, philanthropist, patriot, and statesman. And above all he was a brave, strong man. As Bancroft, the historian, says: "When an infectious pestilence raging in Philadelphia rapidly swept nearly 4000 to the grave Rush despised every consideration of personal safety, and was so true, night and day, to his patients that it was said of him in Europe: 'Not Philadelphia alone, but mankind, should raise him a statue.'" He was perhaps the greatest pupil of William Cullen, whose system he championed in opposition to that of Boerhaave. Chapter III. of Professor Good's work deals with the professional side of Rush's life. Apart from his psychological studies, his contributions to practical medicine have been excelled by many of his countrymen, but it would be hard to name any other who occupies the same distinguished position as a

far-seeing reformer in social and educational affairs. A fearless abolitionist, at a time (and place) when only a strong man could hold such opinions—a humanitarian in his life-long advocacy of penal reform—an ardent temperance advocate whose writings on the subject are still current—an enlightened student of insanity and an early supporter of the humane treatment of its victims—a friend of animals and an incessant pleader for their kindly treatment—such was Benjamin Rush. And beyond all this it is as an educational reformer, rather than as a physician or a patriot, that he is best remembered to-day. It is just here that Sir William Osler finds the special value of Professor Good's book. "It contains," he says, "a critical study of Rush's activities in the establishment of public schools, in the promotion of the higher education of women, in the necessity of national universities, and in the importance of bringing scientific knowledge into the daily life of the home, the farm, the workshop, and commerce. Professor Good constantly reminds one of Locke in his good sense about the education of children; and what a happy criticism to say that punishments meted out indiscriminately to boys for ignorance and immorality confuse their moral sense! For the first time we have here set forth clearly the lifelong work of Rush as an educational reformer, and to Dr. Good as a professor of the subject this has been a labour of love. The profession on both sides of the Atlantic is indebted to him for this interesting picture of one of the most versatile and distinguished of its members. I may add that we have as an appendix a full and accurate bibliography."

MYALGIA OR TRENCH FEVER.

MYALGIA is the name given to a painful affection, apparently involving the muscles or fasciæ. The connexion with true rheumatism is not always obvious, nor is it even certain that the muscles or fasciæ are really involved; but the disorder is often the direct result of damp or cold, or of excessive muscular exertion or strain. Possibly toxins or poisons absorbed from the alimentary canal are responsible for some muscular pains. Thus far Sir Frederick Taylor, and we need hardly look further for a demonstration of the weak nature of the evidence connecting myalgia with rheumatism. A generation ago muscular rheumatism was presumed to be associated with a gouty tendency and lithæmia. The crisp Anglo-American view we should expect to find in Osler and McCrae's System is not there; myalgia is simply ignored. Dieulafoy also has nothing to say on the matter. It remained for the trenches to throw light on this as on other common ailments; for "trench shin" and disabling muscular pains clamoured for investigation. The identification of trench shin as one type of trench fever[1] was made early and is now generally accepted. In a letter to our correspondence columns this week, commenting upon Dr. R. D. Rudolf's "Trench Fever Cachexia,"[2] Mr. A. Bertram Soltau, Colonel, A.M.S., gives reasons for thinking that nearly 80 per cent. of the myalgias of active service are due to the toxins of trench fever. In March last Mr. Soltau circulated a note to all Army medical officers in Flanders calling attention to the great variety of pains associated with trench fever, most of them, however, originating in the fibrous insertion of muscles. The nocturnal exacerbation of the pain and the fact that it is generally increased by warmth negative a muscular origin and distinguish the condition from a true myalgia. Trench fever pain has therewith reached some measure of precise description. It is not unlikely that a comparative study of ordinary so-called muscular rheumatism may establish the same or a similar toxic origin.

[1] T. Houston and J. M. McCrae, THE LANCET, 1916, ii., 632; G. Chambers, THE LANCET, 1917, i., 752.
[2] THE LANCET, Dec. 14th.

ALCOHOL FOR INFLUENZA PATIENTS.

IN view of representations that have been made that there is in some districts a shortage of spirits required in treatment of patients suffering from influenza, arrangements are being made by the Ministry of Food that in the event of information reaching the Ministry indicating that an additional supply of spirits is necessary in any particular district for the treatment of such patients the Ministry will direct a special supply to that district. Steps are being taken by the Ministry to obtain representative medical opinion as to the reality and extent of the need in the various localities affected. All bottles of spirits supplied for this purpose will bear distinctive labels and will only be sold against a certificate from the doctor attending the patient.

THE PREVENTION OF SYPHILIS AMONG INFANTS.

THE generous gift of £10,000 by the Grocers' Company made it possible for the London Hospital to build wards for the treatment of venereal diseases. In-patient treatment is obviously of special urgency in the case of pregnant women infected with syphilis, and this section of the work is beginning to show results in the form of healthy offspring. It was a happy thought on the part of Dr. J. H. Sequeira to combine an "At home," given, on Dec. 18th, to some of the mothers and children who have benefited from treatment, with a medical gathering where the lessons already learned and their further application in the future would be discussed. Lord Knutsford drew attention to the large number of East-End women who miscarried as the result of syphilis, in whom proper treatment would have ensured the birth of children showing no traces of disease. There was need, he said, for other districts and hospitals to organise on a large scale to provide similar treatment. The venereal diseases department of the hospital was supplied with patients by its own obstetric and maternity departments, through the maternity almoners, from the City of London Lying-in Hospital, and by various maternity centres in the neighbourhood. Dr. Sequeira added that both married and unmarried women were dealt with, and since March, 1916, 52 pregnant women had been treated. After treatment in the special department these women were either admitted to the general lying-in ward or were attended by the out-patient charities under the supervision of the obstetric physician to the hospital. He added that, in his opinion, the women after treatment were not liable to infect others, either in the ward or outside, if the usual precautions were taken. In the East-End coöperation between the maternity and infant-welfare centres and the venereal clinic at the hospital was actually very good. He had found it safe in practice to give injections of salvarsan to pregnant women, and thought it essential to treat every such patient at

the earliest possible moment. Sir Arthur Newsholme also emphasised the need for coöperation between venereal clinics, child-welfare and maternity centres and the general practitioner. But coöperation, however necessary, will prove futile without the provision of hospital accommodation. The need of further facilities for the treatment of syphilitic pregnant women as in-patients is very great, and sufficient hospital accommodation must be provided for them both before and during confinement. In London the Thavies Inn Venereal Centre for Pregnant Women provides the only other residential treatment, and the encouraging results obtained there were described in THE LANCET of Dec. 7th by Mr. John Adams. Coöperation and increased accommodation are the two essentials in the solution of a problem which brooks no delay.

THE SCOTTISH UNIVERSITIES ELECTION.

WE have received a letter from Mr. R. W. Cockburn, agent for Professor W. R. Smith in this election, in which the statement is apparently maintained that Professor Smith was "adopted by the Medical (Parliamentary) Committee for this constituency." He was not so adopted. Upon Professor Smith, at a meeting of the Committee, mentioning that he might not be elected for the Scottish Universities, his name was added to a general list of medical candidates whose wishes to find a constituency the Committee was willing to further. The Committee's policy is to assist medical men to get into Parliament, and with that object in view an offer was made to Professor Smith, and to all other medical candidates for Parliament, to try to find speakers, political views and individual candidature having nothing to do with that offer. In a circular letter to the Editor of THE LANCET, headed "The Scottish Universities Parliamentary Association," Sir Thomas Oliver, as chairman of the Association, says, "Professor Smith has also been adopted by the Parliamentary Committee." The one and only inference must be that Professor Smith was adopted as a candidate in relation to the Scottish Universities vacancy, and that inference, if drawn, would have been incorrect.

Sir William Whitla has been returned by a very large majority as Member for Queen's University, Belfast. Sir Robert Woods, standing as an Independent, has been returned for one of the Dublin University seats.

Dr. Sydney Russell Wells has been appointed to represent the University of London on the General Council of Medical Education and Registration.

M. Albert Calmette, director of the Pasteur Institute at Lille, has succeeded M. Emile Roux as director of the parent institute in Paris.

Sir Robert Philip has been elected President of the Royal College of Physicians of Edinburgh, and Dr. A. H. Freeland Barbour, Vice-President.

THE appointments to the Industrial Fatigue Research Board have now been completed and include, in addition to the names given in THE LANCET of Nov. 23rd (p. 718), those of Mr. Kenneth Lee, Mr. R. R. Bannatyne (representing the Home Office), and Dr. C. S. Myers, F.R.S., Director of the Psychological Laboratory, Cambridge. The Board expresses its readiness to consider any suggestions submitted to the secretary at 15, Great George-street, London, S.W. 1.

THE ANNUAL REPORT FOR 1917 OF THE CHIEF MEDICAL OFFICER OF THE BOARD OF EDUCATION.

II.[1]

EVERY chapter of Sir George Newman's report brings into relief some fresh aspect of the physical condition of the children which must be of absorbing interest to all who have at heart the moral and material welfare of the people. The keynote of the whole report is insistence upon the importance of the *positive* function of school hygiene, the education and building up, the strengthening and development of the natural powers of the body of the normal child, that it may be able not only to resist disease, but to become its best. It is clear that there has hitherto existed on the part of the local education authorities a misunderstanding of the true principles involved, a failure to attain to the necessary breadth of vision. They have thought their duty done with the carrying out of what Sir George Newman terms the *negative* function of school hygiene, the arrangements for treatment of the defective child. It is the ordinary child who is the key to the nation's health, and it is the adaptation of the environment, so that Nature may have its way and the child grow in body and mind, that the local education authority must make its business. Hence the need for physical exercises, games, school meals, play-centres, and open-air lessons; for vigilance and strict control of premature employment; for the claims for more sleep at night and more rest in the day.

School Dental Work.

Not that even the negative function has been hitherto well and conscientiously performed; far from it. Despite the facts that are known with regard to the condition of the children's teeth and the resultant loss of physical efficiency in the population, and despite the fact that local education authorities for ten years have had the legal power, we learn from the report that a beginning, at present incomplete and inadequate, has been made in 151 areas, but in 167 educational areas the authority has undertaken no dental treatment at all.

The Board have suggested that an authority's school dental scheme should at least provide for—

(i.) The inspection and treatment of children of 6–8 years of age.

(ii.) The re-examination at intervals of not more than one year of children who have already received treatment and the provision of supplementary treatment where required.

(iii.) The periodical inspection and treatment of other children as may be necessary and of "specials."

At present no large authority is carrying out this complete scheme, and few are doing more than examine and treat the 6–8 age-group. The extent to which school children at these ages require dental treatment is shown by the findings of school dentists in different areas, and these for 1917 vary from 79 and 80 per cent. in London and Liverpool respectively to 97 and 99 per cent. in Southport and Wrexham.

The Board have advised that dental inspection should be carried out only by qualified dentists, and preferably those undertaking subsequent treatment; but in exceptional cases, particularly rural areas, they are prepared to accept proposals for the carrying out of dental inspection by the school doctor, provided only that he is exceptionally qualified. With regard to dental treatment, the services at present rendered "probably do not cover more than about one-tenth of what is required to deal with half the school population." The three great difficul ies in the way are stated to be: first, the grave shortage of dentists; secondly, the unattractiveness of school dental work; and, thirdly, the unwillingness of authorities to incur the expenditure of a scheme. About this third difficulty there is no doubt, and our experience is that the first two difficulties are merely cloaks brought forward to hide the third. However this may be, the alleged difficulties have led a few authorities to make the proposal to the Board that they should use unqualified "dental dressers" who, with the help of school nurses, would, it is suggested, be able to deal with a large portion of the school dental work. It appears that schemes on these lines are actually in being. Now these proposals cut at the root of much that is of fundamental importance in medical practice,

[1] No. I. was published in THE LANCET of Dec. 21st, 1918, p. 855.

and it behoves the profession to scrutinise them with meticulous care. It is stated that the British Dental Association considered this question of "dental dressers" and reported in guarded terms in July, 1917, and the subject is, moreover, under the consideration of the Dentists Act Committee of the Privy Council.

We have no wish to allow any punctilios of professional etiquette or of medical tradition to stand in the way of any reform or of any arrangements which may be necessary for improving the condition of the nation's children. And professional pride must be denied and set aside and mortified if it obstructs any proposal proved on economic grounds to be absolutely necessary. But we must say that on present showing the motive of the present proposal appears not to be necessity but parsimony. At any rate, it appears to us perfectly extraordinary that Sir George Newman should solemnly set down as one of the things that could be done by unqualified dental dressers that very inspection of the teeth of the children which he has already defined as a work requiring such skill that it cannot in general be entrusted under the Board's rules to the school medical officer himself or to the experienced school doctors working under him. We trust it may be long ere our professional pride be again so mortified, and we may be forgiven if we feel naughtily thankful for the existence of a Dentists Act Committee and if we desire more power to its elbow, especially as we gather that, owing to the reference of these questions to that Committee, "further action has been suspended" for the moment.

Special Schools and Open-Air Schools.

"A substantial part of the medical treatment of a certain group of defective children—blind, deaf, feeble-minded, epileptic, and tuberculous—is a special form and character of education." We therefore have "special schools" for about 1 per cent. of the total school population. During the year 1917 there was an increase of 8 schools for the blind, 6 for the tuberculous, 4 open-air schools, and 3 others, making a total of 21 schools. The number of scholars on the registers of special schools in January 1918, was 30,695, including 2520 blind, 3938 deaf, 14,343 mentally defective, and 5792 physically defective. It has been estimated that the number of physically defective children in England and Wales is between 35,000 and 40,000, but up to the present only 25 local education authorities have provided day schools and 7 have provided residential schools. It is the possibility of making such statements as these which spies out the poverty of our land, and to some extent explains the Prime Minister's statement to the effect that our recruiting returns were worse than those of any other belligerent nation in regard to rejections for physical unfitness.

Our local education authorities and our local health authorities, though armed with the necessary powers, have not been carrying out their duty. Even the London County Council, which in many ways has given a lead to all the other authorities in the magnitude and extent of its efforts to alleviate the condition of the children, has lamentably failed in some directions and in none more unaccountably than in developing its open-air school accommodation. "The astonishing fact still remains that London, with 650,000 children, possesses only two ordinary small open-air schools accommodating 210 children."

It is interesting to learn that a Special Aural Board of the Ministry of Pensions has been working in coöperation with officers of the Board of Education in organising the training of soldiers and sailors disabled in the war through deafness and mutism. Twenty-five centres for the teaching of lip-reading have been opened in various parts of the country and the results have as a whole been very satisfactory.

By far the biggest piece of work coming under the heading of special schools, of course, is the care of the mentally subnormal child. The report rightly points out the importance of this class in relation to the activities of the education authorities as a whole. It is fundamentally a part of the larger question of national mental capacity, and not, as is so often assumed, an issue affecting a handful of hopeless children. The war, unfortunately, has rendered it impracticable to secure for the mentally defective child the attention which it was hoped would have resulted from the passing of the Mental Deficiency Act of 1913, and of the Defective and Epileptic Children Act of 1914.

Nevertheless, the work of "ascertainment" under the former Act has been proceeded with in a number of areas, and some local education authorities have consequently been brought face to face with the necessity of considering the requirements of all children mentally subnormal in whatever degree. The "border-line case" keeps on bobbing up, acting as a bridge between the normal and the subnormal, and destroying the "water-tight compartment" method of dealing with the latter, which would be inimical to scientific progress. The present tendency, therefore is to view the question more as a whole and more in relation to the other activities of the education authority than was formerly the case, and the benefits of the Acts are consequently not confined to the feeble-minded, but affect also the dull and backward, and even the mentally normal child.

These questions have stimulated such inquiries as the recent investigation by Mr. Cyril Burt, psychologist to the London County Council, into the "Distribution and Relations of Educational Abilities." Two broad facts emerge from this inquiry: first, the educational attainments of a "defective" correspond, on an average, to those of a "normal" just one-half his age; secondly, in the whole county of London the number of backward children above the "defective" standard is over 10 per cent. of the whole.

The development of methods of education which will meet the needs of the large class of dull and backward, as well as of the small class of the feeble-minded, is therefore a requirement which should arrest the attention of the authorities. Such methods include the provision of suitable forms of hand work and a more rational system of physical development. In the latter connexion the announcement will be hailed with satisfaction that the Board contemplate the issue of a new edition of their "Syllabus of Physical Education," in which effect will be given to more modern views.

The Future.

The future of school hygiene in this country and the well-being of the child and adolescent population are bound up with the administration of the medical arrangements under the new Education Act. To the section of the report dealing with this Act we, therefore, turn in order to glean the attitude of the Board towards the problems of the future. We are not disappointed. The keynote of the whole report here becomes more than ever insistent. The narrow "bottle of medicine" conception of the purpose of the School Medical Service still held by many persons and authorities is again severely trounced. The ideal of prevention rather than cure is held up as worthy of all acceptation. The Education Act of 1918 is concerned with the physical, as well as the mental, development of the rising generation from the age of 2 years to that of 18. Measures for the promotion of healthy physical development must be preventive as well as remedial. The Act is concerned not only with the provision of facilities for treatment, and special schools for abnormal children, but with the encouragement of measures designed to improve the health, and bring out the physical capacity for development of the whole juvenile population. "What is required is not the devotion of exclusive attention to the diseased child ..... but a broad, carefully considered, and unified system of physical care and development of all children of school age." The foundation of any scheme for attending to the health and physical care of the scholars is defined as a complete system of inspection of all the scholars and reinspection of all found defective.

The dates upon which the sections of the Act come into operation are not all yet fixed, although a number of provisions became operative on August 8th, 1918 (the date of passing of the Act). The Act imposes upon authorities a duty to make arrangements for the treatment of children educated in public elementary schools, thus making this function in future compulsory instead of voluntary, but the section is not yet in operation. It imposes a duty upon authorities to provide for medical inspection in secondary and continuation schools, and the power is given to provide facilities for treatment; this section is in operation except so far as it imposes a duty.

It is important to note that the Act prohibits the establishment of a general service of domiciliary treatment by medical practitioners, but provides that in making arrangements for treatment an authority shall consider how far they can avail themselves of the services of private medical prac-

titioners. The Act makes it the duty of an education authority to ascertain what children within their area are physically defective or epileptic within the legal definition, and also to make provision for their education between the ages of 7 and 16, but this section is not yet in operation.

Several sections of the Act which are not yet in operation deal fairly drastically with the employment of children of school age, but it is interesting to note that a section which is already in operation empowers the local authority to prohibit or restrict any employment of a child which, as a result of a report by the school medical officer, or otherwise, they are satisfied is prejudicial to his health or physical development, or which renders him unfit to obtain proper benefit from his education. The clauses of the Act empowering local authorities to establish or to aid nursery schools for children between 2 and 5 are already in operation.

The final paragraph of the section of the report dealing with the Act forms such an admirable epitome of Sir George Newman's conclusions, ideals, and aspirations that we cannot do better than quote it in extenso.

> The fundamental purpose of the new Act is "the progressive development and comprehensive organisation of education" available for all persons capable of profiting thereby. It is indisputable that the primary factor in such an organisation must be the physical factor. A system of education, however perfect, must fail if the physical and mental condition of the person to be educated be not healthy responsive, and alert. Indeed, the association between physique and education is even closer, for the education and development of the young child is largely a question of bodily nature and nurture. Not only must the body be sound and unimpaired by defect or deformity, but its training and development is an integral, essential, and vital part of all true education. The local education authorities throughout England and Wales are now in possession of an adequate and comprehensive instrument for achieving these great national ends. The ines imable good which they have accomplished in ten years, with meagre and somewhat indifferent machinery, affords good promise of their wise and far-seeing use of the new and enlarged opportunity, at the door of which they now stand.

We devoutly re-echo Sir George Newman's words, and we should like to share his confidence to the full, but the supineness of the local education authorities in the past, as revealed by his own report, raises grave doubts.

URBAN VITAL STATISTICS.

(Week ended Dec. 14th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at 16,500,000 persons, the annual rate of mortality was 20·2, against 36·5 and 28·6 per 1000 in the two preceding weeks. In London, with a population slightly exceeding 4,000,000 persons, the death-rate was 18·2, or 7·8 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 7·4 in Bournemouth, 7·9 in Walthamstow and in Oxford, and 10·0 in Cambridge, to 38·6 in Preston, 34·7 in St. Helens, 42·1 in South Shields, 42·8 in Grimsby, 48·9 in Barnsley, and 54·1 in Sunderland. The principal epidemic diseases caused 148 deaths, which corresponded to an annual rate of 0·5 per 1000, and included 48 from diphtheria, 47 from infantile diarrhœa, 23 from whooping-cough, 14 from measles, 12 from scarlet fever, and 4 from enteric fever. The deaths from influenza numbered 1885, against 3574 in the preceding week, and included 322 in London, 164 in Birmingham, 111 in Manchester, 82 in Sunderland, 53 in Nottingham, and 51 in Liverpool. The 1089 cases of scarlet fever and 1017 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 10 and 11 below the respective numbers remaining at the end of the previous week; there were also 2 cases of small-pox under treatment. The causes of 50 deaths in the 96 towns were uncertified, of which 8 were registered in Birmingham, and 4 each in Southend-on-Sea, Hull Stockton-on-Tees, and Gateshead.

Irish Towns.—The 168 deaths in Dublin corresponded to an annual rate of 22·0, or 0·5 per 1000 below that recorded in the previous week, and included 24 from influenza, 2 from infantile diarrhœa and 1 each from scarlet fever and whooping-cough. The 186 deaths in Belfast were equal to a rate of 24·7 per 1000, and included 1 each from whooping-cough, diphtheria, and infantile diarrhœa.

METROPOLITAN HOSPITAL SUNDAY FUND.—At the annual meeting held at the Mansion House on Dec. 20th, the Lord Mayor presiding, the members of the council were re-elected, with the addition of the Rev. E. Marling Roberts, the Rev. W. G. Pennyman, Dr. Jowett, and Sir Charles Hanson to fill vacancies. Hospital Sunday, 1919, was fixed for June 22nd. The report stated that the total collection for 1918 (the forty-sixth) had amounted to £92,055, an increase of over £15,000 as compared with 1917. This increase, which had exceeded the highest previous record, had enabled the council to distribute a sum of over £85,000 among the hospitals and medical charities of London, being £15,000 more than any previous distribution. The collections in the churches amounted to £43,077, or £5739 more than in 1917, while the donations were £13,259, showing an increase of £5106. The fund received a donation of £5000 from the American Red Cross in recognition of the work done by London hospitals for the Allied wounded.

Correspondence.

"Audi alteram partem."

TRENCH FEVER CACHEXIA.

To the Editor of THE LANCET.

SIR,—The article by Colonel R. D. Rudolf, C.A.M.C., on Trench Fever Cachexia, in THE LANCET of Dec. 14th, draws attention to a condition which has been recognised in France for the last two years. It is interesting to have, from an observer in England, a confirmation of many of the opinions and conclusions arrived at from seeing cases in the earlier stages, and the subject is of such importance for the future that it cannot be too widely known and discussed. The literature of trench fever has been voluminous, but has mainly been directed towards a description of the types of the disease as seen in the earlier stages, or to a discussion of the etiology and the infectivity of the disease, whilst little attention has been paid to the later stages.

Everybody is now well acquainted with the common types of the disease—the short, the long, and that with a prolonged initial fever. The work of the American Red Cross Commission proved that these are all simply variations of expression of a common infection. In addition, many of us had recognised, as far back as 1916, a type which we called the "smouldering" type, in which the patient complained of debility, weakness, irregular pains, &c. This was regarded, not as a distinct type, but rather as a condition following on after an infection from which the man had apparently recovered completely, and yet the infection "smouldered" on or reappeared after a period of latency. The parallel to malarial cachexia which Colonel Rudolf draws is an apt one, and evidently the cases which he describes are similar to those which have been a source of much perplexity in France.

The parallel may be carried even further, for trench fever apparently has the power to remain latent and flare up again, more particularly after any trauma. It was no uncommon experience to notice this recrudescence in the surgical wards, as many of the wounded commenced within a few days of being injured a typical febrile attack which could not be accounted for by the condition of their wounds, and cross-examination then elicited a history of previous trench fever. Hard work, physical or mental, over a prolonged period, also appeared to have the power of re-kindling the disease. As to how long this latency is maintained, we have as yet no accurate knowledge, but cases have now been followed for nearly four years, in which recrudescences of diminishing virulence have appeared, and in which a diminution of vigour has been noted throughout.

A recognition of these facts will make for more accurate diagnosis in the Army, and will largely eliminate that popular diagnosis of "myalgia" Captain F. B. Chevasse and Captain Marr have independently worked at this point, taking groups of cases labelled "Myalgia," and trying to establish a correct diagnosis. The former considered that some 43 per cent. were in reality suffering from trench fever, and the latter put the figure at nearly 70 per cent. My own observations, made on a less exact but a wider scale, by "sampling" admissions in many areas, would indicate that at least 70 per cent. and probably nearly 80 per cent. of the "myalgias" were in reality suffering from trench fever. The majority of the cases included in these observations were examples of the cachectic period of the disease.

A correct diagnosis may not be easy in the late stages when cases are seen in English hospitals or after discharge from the Army. A careful consideration of the history will often furnish the clue. Colonel Rudolf has pointed out the value of the temperature chart, which we learned to rely on very largely. So much was this the case that in order to obtain a record from as early as possible a moment all field ambulances in France were supplied with a rubber stamp giving an impression of a six days' chart for use on the field medical card. The oscillation of the temperature, giving a diurnal swing of two or more degrees, appears to be just as important as an actual rise above the normal. Other points to look for are a quickened pulse, maintained in the eighties, tremor of hands and tongue, small patches of yellow fur on the tongue, and the presence of spots of local tenderness on palpating over the muscular insertions and indicative of a persistence of that fibrous involvement which

s characteristic of the earlier stages. I am interested to note that Colonel Rudolf finds persistence of splenic enlargement, as that had not been determined in France. The presence of a relative lymphocytosis, mainly of the large lymphocytes, may be of value in the doubtful case.

Practitioners will in the coming future be faced frequently with the diagnosis and the treatment of these cases, and when it is remembered that probably a fifth of the cases of disease, as apart from wounds, in the armies in France has been caused by trench fever, the numerical importance of the question is obvious, especially as we do not yet know for how long this liability to recurrence will be maintained.

I am, Sir, yours faithfully,

A. BERTRAM SOLTAU,
Colonel, A.M.S.

Dec. 17th, 1918.

PHTHISIS IN FACTORY AND WORKSHOP.

To the Editor of THE LANCET.

SIR,—Dr. M. F. Boulenger (THE LANCET, Dec. 14th) apparently considers "hereditary tuberculosis" as the cause of tubercle in abstainers and alcoholism as the cause of it in drunkards. In the interests of clarity it would be well if he explained what "hereditary" means in this connexion. I understand "congenital tuberculosis," "congenital syphilis," "congenital ophthalmia," "congenital small-pox," and the like. These expressions denote that the micro-organisms of disease infected the child while it was yet within the mother's body. But what does "hereditary" tuberculosis imply? Would Dr. Boulenger class a bullet that had passed through the mother and lodged in the child as a hereditary bullet? Bullets and bacilli alike are foreign bodies. As far as the evidence goes, congenital tuberculosis, unlike congenital syphilis and ophthalmia, is very rare.

In tuberculosis, as in all other developments, two factors are concerned, nature (heritage, susceptibility, predisposition) and nurture (*terrain*, environment). Both the susceptibility and the environment vary enormously in relation to individuals and races. Thus, some Englishmen, and all Polynesians, are very susceptible; most Englishmen but no Polynesians are able to survive in the slums of great cities; practically no Englishman contracts the disease in Polynesia where it is exterminating the native. The rule that "Every human race is resistant to every lethal and prevalent human disease in proportion to the length and severity of its past experience of that disease" applies to tuberculosis. Thus, Jews, who have 20 centuries of urban life behind them, are more resistant than Englishmen, who are more resistant than Scottish Highlanders, who are more resistant than American negroes, who are more resistant than African negroes, who are more resistant than Polynesians. The rule itself is explainable only on the supposition that powers of resistance (which are not foreign bodies) are inheritable, and that each lethal disease weeds out the weak against *itself*, leaving the race to the strong.

The cause of tuberculosis is the *Bacillus tuberculosis*. All conditions which favour the survival and concentration of the bacilli and their passage to susceptible persons—e.g., ill-lighted, ill-ventilated, and crowded buildings—conduce to the spread of the disease. So, also, do all conditions—excessive drinking, among others—which depress the vitality of human beings. I do not know whether statistics exist, but I venture to predict that women industrial workers—because they work in crowds—suffer more from the disease than women engaged in house duties. Dr. Boulenger insists that the "essential cause" of adult tuberculosis is alcoholism, and so explains the fact that male industrial workers suffer more than their wives whose environment he regards as worse. But do not these men sleep in their own homes? And was alcoholism the cause of the prevalence of the disease in convents, jails, and Pacific islands, and the essential cause of most of the many deaths among the men and women we have each known? Of course, excessive drinking is sometimes a contributory cause. And, of course, excessive drinking is in itself a tremendous evil. But intemperance in argument is not likely to cure intemperance in drinking. The case of vaccination should be borne in mind. Originally medical men claimed that vaccination endowed the individual with permanent immunity to small-pox. As a fact it confers only temporary immunity, which, however, is sufficient, for vaccination, repeated when necessary, abolishes small-pox. But to this day its opponents rely on disproof of the original and long-abandoned claim as a principal weapon for discrediting not merely vaccination, but all protective inoculation. Excessive claims, even when made in such a good cause as temperance, tend to meet the proverbial fate of vaulting ambition which overleaps itself.

I am, Sir, yours faithfully,

G. ARCHDALL REID.

Southsea, Dec. 15th, 1918.

DISPENSARY SUPERVISION IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I have noted with satisfaction the interest which my article (THE LANCET, Oct. 26th) appears to have aroused, because I believe that the favourable opinion of the Inter-Departmental Committee on Tuberculosis as to the value of home treatment under close supervision is justified by more recent experience upon a large scale. Of course, like all other antituberculosis measures it has its limitations, but this is no argument against its utilisation in the large number of cases where it may be satisfactorily applied, if the requisite trouble be taken.

The first fact that has to be faced is that so long as patients are solely under the care of general practitioners, close supervision of their hygienic routine is seldom exercised in working-class practice, and, as a matter of fact, on the tuberculosis officers' or dispensary nurses' first visits in my area there is often little visible evidence of any instructions having been given to patients as required by the Tuberculosis Regulations. Even when such instructions have been given there is apparently nothing in the Regulations requiring a panel doctor to see that they are actually followed. The tuberculosis dispensary organisation has thus a great field of activity, and in the administrative county of Lancashire we are doing our best to make full use of our opportunities. Apart from the personal efforts of the dispensary staff in giving simple hygienic instructions and in getting them carried out voluntarily, it has been possible in a large number of cases indirectly to aid the work by means of the voluntary care committees, which assist patients on the understanding that the instructions given are properly carried out. The six care committees in my area expended in 1917 over £1000.

The knowledge, too, that certain benefits are obtainable from Approved Societies in the case of insured persons and from the Ministry of Pensions in the case of discharged sailors and soldiers conditionally upon the treatment being properly carried out is also of use in certain cases.

Perhaps I did not make it quite clear in my article that patients with active disease receive domiciliary treatment from general practitioners, and that the dispensary organisation works in close association with them. In this way patients obtain the advantages of both agencies.

With regard to the visits of the dispensary nurses, which are always paid without previous notice, it must be remembered that many of the cases were quiescent or arrested. These do not, of course, require frequent visiting, so that it has been possible for the more advanced cases to receive more frequent visiting. The number of visits paid might with advantage be increased, and at the end of the war it is hoped to augment the staff of nurses and thus pursue more intensively the dispensary supervision.

I should have done better to have used the term "satisfactory isolation" or "sufficiently complete isolation," instead of "complete isolation." In 1917 I obtained satisfactory isolation in 70 per cent. of 1615 cases of pulmonary tuberculosis. As a matter of fact, I do not think that "complete" isolation need be aimed at, since it is now generally recognised that infection must usually be massive to be the potent factor. We are all exposed to the tubercle bacillus in a greater or less degree, and although there is evidence that 97 per cent. of persons are actually infected the dose is insufficient in most cases to break down the resistance. If the instructions as to disposal of sputum, &c., are reasonably followed the risks of infection should be slight. In my opinion the greatest danger from infective cases at home arises from the large, untapped reservoir of unnotified cases, to which Dr. G. Lissant Cox referred in his recent letter. So long as large numbers of cases die either unnotified or only notified shortly before death the control of tuberculosis must necessarily be imperfect, and for this it is not fair to blame the dispensaries.

It is a great advantage if patients can receive two or three months' institutional treatment soon after they come under

treatment, while there is a residuum of advanced cases for whom permanent removal to a suitable hospital is desirable, owing to the impossibility of securing adequate nursing and isolation at home. The compulsory powers of removal possessed by a few county boroughs ought, in my opinion, to be given to all county and county borough councils.

In conclusion, I submit that even in the worst cases under dispensary supervision the home conditions are superior to those usually found where this is absent, and that the results would be even better were sufficient funds available to supplement the resources of the poorer families. It is not improbable that the work of the voluntary care committees will have to be taken over by the dispensary organisations and become a national charge.

I am, Sir, yours faithfully,

GEORGE JESSEL,

Dec. 18th, 1918. Tuberculosis Officer, Lancashire County Council.

LADY ROBERTS' FIELD GLASS FUND:

RETURN OF GLASSES NOW ASKED FOR.

To the Editor of THE LANCET.

SIR,—**May I, through the hospitality of your columns, ask all officers and others who have received glasses or telescopes on loan through my Fund to send them back to me now for return to their owners. All instruments lent through my Fund bear the letters N.S.L. (National Service League), followed by a letter and a number. I should be glad if officers and others returning glasses would enclose in the case a note of acknowledgment for the owner.**

I wish to record my gratitude, not only to the public for the munificent loan of 30,000 glasses, but also to the press for the valued help which it has given this undertaking.

The address for glasses and correspondence is the Manager, Lady Roberts' Field Glass Fund, 64, Victoria-street, Westminster, S.W. 1.

I am, Sir, yours faithfully,

Dec. 19th, 1918. ROBERTS.

THE PRACTICE OF THE ABSENTEE.

To the Editor of THE LANCET.

SIR,—It is gratifying to see that money is still being subscribed to the Belgian Doctors' and Pharmacists' Relief Fund. This is as it should be, but it is of interest in connexion with Sir Watson Cheyne's proposal to lend money to medical men whose practices have been filched from them owing to their absence at the front. These men have been as much injured by their professional brethren as their Belgian colleagues have been by the Hun. Yet the proposition of Sir Watson Cheyne savours more of the spirit of the Jewish moneylender than anything else.

Would it be too much to expect that the British doctors should meet with as much sympathy and help as the Belgian? Many of us have been away on active service for over four years, having "willingly" given up "all" in answer to the pitiful cries of our sick, wounded, and dying fellow countrymen. Surely, then, we are not to be expected to return home and forced to beg from our professional brethren who have stayed at home. All the medical men in this theatre of operations with whom I have discussed Sir Watson Cheyne's proposals are strongly opposed to it, as it is adding insult to injury.

It is now suggested by Sir Watson Cheyne that some of the ill-gotten gains of the medical pilferers should be advanced on loan at interest to their victims.

I am, Sir, yours faithfully,

Dec. 6th, 1918. MAJOR, R.A.M.C. (T.C.)

THE LANCET, VOL II., 1918: THE INDEX.

THE Index and Title-page to the volume of THE LANCET which is completed with the issue of to-day is in preparation. Owing to the continued shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a *post-card* which is more convenient for filing purposes than a letter) to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

The War and After.

THE CASUALTY LIST.

THE names of the following medical officers appear among the casualties announced since our last issue:—

Died.

Surg.-Lieut.-Cdr. M. H. Langford, D.S.O., R.N., was a student at Middlesex Hospital, London, and qualified in 1909. He thereupon joined the Royal Navy and was serving on the *Inflexible* both when she took part in the action against the German squadron off the Falkland Islands and also when she struck a mine in the Dardanelles. It was in connexion with this latter incident that he was awarded the D.S.O. He died at Dar-es-Salaam of influenza.

Capt. J. V. Duffy, R.A.M.C., qualified at Glasgow in 1914, and joined up shortly afterwards.

Wounded.

Capt. R. H. Jones, R.A.M.C., attached Worcester Regiment.

OBITUARY OF THE WAR.

ROBERT ERNEST LEE, M.D. T.C.D.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain R. E. Lee, who lost his life through the sinking of R.M.S. *Leinster* on Oct. 10th at the age of 35 years, was the second surviving son of Edward Lee, J.P., Blackrock, co. Dublin. Educated at Trinity College, Dublin, he graduated in medicine in 1910, and obtained the M.D. degree in the following year. He was then house surgeon to Bootle Hospital, Liverpool, for two years, and resident medical officer of the Royal Hospital for Incurables, Donnybrook, Dublin, 1912–13. Before the outbreak of war he had been on a sea voyage as medical officer on one of the Holt Line ships. When war was declared he joined the R.A.M.C., and served in France from January, 1915, until he met his death on returning to duty after 14 days' leave.

NOEL JAMES ALLAN, M.B., CH B. LIVERP.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain N. J. Allan, who died of burns on Oct. 18th in Mesopotamia at the age of 32 years, was second son of Dr. J. H. Allan, of Liverpool. He was educated at St. Francis Xavier's College, where he was distinguished in mathematics and chemistry. After leaving school he qualified in pharmacy, but later decided to take up medicine, and entered the University of Liverpool. In the course of his medical studies he gained the Kanthack medal in pathology, the senior Lyons-Jones scholarship, and the Derby prize for clinical medicine, and he graduated with honours in 1916. He held for a short time the posts of house surgeon and house physician at the Royal Infirmary, and early in 1917 joined the R.A.M.C. and served continuously in the East until his death.

MAURICE WILLIAM HOLT MILES, M.B. LOND.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain M. W. H. Miles, who died on Nov. 25th at the age of 25 years, was son of William Miles, of Streatham. Educated at Littlestone and Merchant Taylors' School, where he obtained a scholarship for St. Thomas's Hospital, he volunteered for service at the commencement of the war and was sent to France, and afterwards to India, Egypt, and the Dardanelles. He was ordered home to qualify, took the diploma of the Conjoint Board in 1917, and became house physician at St. Thomas's Hospital before joining the R.A.M.C. His health was already considerably undermined by malaria and dysentery. Invalided out of the Army about two months ago, he again returned to St. Thomas's Hospital, whence he recently took the M.B. degree. His death was due to pneumonia following influenza.

JOHN EDWARD HODGSON, M.R.C.S. ENG., D.P.H.,

LIEUTENANT-COLONEL, ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel J. E. Hodgson, who died on Nov. 5th at Dédéagatch while with the British Salonika Force, was eldest son of the late Caleb Hodgson, of Carlisle, and stepson of the late Colonel J. J. Durant. He was educated at Grosvenor House School, Carlisle, and Owens College, Manchester, and took the diplomas of the Conjoint Board in 1898, and the D.P.H. Lond. in 1913. After acting as resident clinical assistant at the Barnes Convalescent Hospital, Cheadle, he entered the R.A.M.C. as Lieutenant in January, 1899, and during 1899–1900 served in the South African War. He took part in the advance on Kimberley, including the actions at Belmont, Enslin, Modder River, and Magersfontein, and was awarded the Queen's medal with two clasps. After serving at Dover for a time he proceeded to India in 1901, and was appointed staff surgeon, Fort William, Calcutta, which appointment he held for three and a half years, finishing his tour of foreign service at Ranikhet. He was gazetted captain in January, 1902, major in 1910, and lieutenant-colonel in 1915. After serving over three years in the London district Colonel Hodgson was appointed sanitary specialist, Northern Command, in January, 1914, and in August, 1916, was appointed A.D.M.S., 12th Corps, Salonika, and there served, with only one short leave, until his death, which was due to pneumonia following on influenza. In December, 1917, he was mentioned in despatches. Colonel Hodgson leaves a widow and one son.

Captain (acting Major) WINFRED SMYTH MACDONNELL, C.A.M.C., who died on Nov. 15th, aged 29 years, was a native of Port Hood, Nova Scotia, and graduated in medicine at Dalhousie University, Halifax, N.S., in 1910. He served for seven months in the Royal Navy, with the R.A.M.C. in France for one year, and was appointed to the C.A.M.C. in August, 1916. He was attached to the Duchess of Connaught's Hospital, Taplow, until last September, when he was transferred to the London area and appointed D.A.D.M.S.

JAMES GASTON, M.B., B.S. R.U.I.,

MILITARY CROSS;

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. Gaston, who died of wounds received in France on Nov. 5th, was eldest son of Andrew Gaston, Carabeg, co. Antrim. Educated at Ballymena Academy and Queen's College, Belfast, he graduated at the Royal University of Ireland, and when war broke out was engaged in an extensive practice in Durham. He joined the R.A.M.C. in December, 1914, and went to France in March, 1915. After serving with a West Riding field ambulance he was attached to the 5th K.O.Y.L.I. as battalion medical officer. He was wounded in September, 1916, and after recovering from his wounds he again went to France in January, 1917, and was attached to the Suffolk Regiment. In the following April he was awarded the Military Cross for conspicuous bravery in the field. Captain Gaston was known to his chiefs as a brave and courageous officer and to his colleagues as an agreeable companion.

THE HONOURS LIST.

The following awards to medical officers are announced:

K.C.I.E.—Lt.-Gen. T. J. O'Donnell, C.B., D.S.O., R.A.M.C., Director of Medical Services, India.

C.I.E.—Col. H. J. Barratt, R.A.M.C. (retired), Assistant Director of Medical Services, Meerut Division; Col. S. C. Philson, R.A.M.C. (retired), Assistant Director of Medical Services, Karachi Brigade.

C.B.E.—Col. W. Molesworth, C.I.E., V.H.S., I.M.S.; Col. A. W. Sheen, A.M.S. (T.F.).

O.B.E.—Maj. A. E. Walter, I.M.S.; Maj. (acting Lt.-Col.) P. J. Van Collier, S. African M.C.; Lt.-Col. G. M. De Kock, S. African M.C.; Lt.-Col. J. R. McGregor, S. African M.C.; Lt.-Col. (Hon. Col.) H. T. Mursell, S. African M.C.

MENTIONED IN DESPATCHES.

In a despatch received from the Commander-in-Chief, East African Force, dated Sept. 30th, 1918, the following references to the medical services appear:—

Great efforts were made to keep the hospital accommodation and all health and sanitary conditions up to the high standard which the Pike Commission and the visit of Major-General Scott indicated as being aimed at in other theatres. The result has been highly gratifying. The sick-rate among the troops, and particularly among Europeans, must always be heavy in a tropical climate, but it is satisfactory to know that everything possible has been done to alleviate suffering and restore health. Among the porters there was an enormous improvement both in the sick and death rates; in fact, the latter is now very little in excess of peace rates.

A school for training natives as hospital attendants and dressers was started at Dar-es-Salaam, and has proved an unqualified success, and great credit is due to the officers responsible for it. After the completion of their military service the natives thus trained should prove a distinct asset to their respective Protectorates.

The native medical corps recruited in Uganda was of special service to us.

Colonel G. W. Tate, C.M.G., D.S.O., M.B., Army Medical Service, deserves great credit for the very efficient manner in which the work of the Medical Services has been carried out, in spite of the difficulties inseparable from active service in a tropical country.

"Silver Badge" calls attention to the inadequate scale of remuneration offered by the War Office to certain medical officers of war hospitals. The operative work in these hospitals may, he says, be carried out by three classes of surgeons: (1) men with temporary commissions; (2) *à la suite* staff with territorial rank as part-timers; (3) part-timers with no commission. The first two classes are paid according to their rank, as a rule of major or lieutenant-colonel, but the third class receives 22*s.* 6*d.* per day, attending only when summoned by the officer in charge of the hospital, every day for which he is not called resulting in a credit of 22*s.* 6*d.* to the hospital. In this way "Silver Badge" claims that the surgeon loses touch with the cases upon which he has operated, while his work is crowded into two or three days a week. He considers that part-time surgeons should be paid an adequate remuneration for their work, and on a monthly basis.

Medical News.

UNIVERSITY OF LONDON.—At examinations held recently the following candidates were successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Louis Abel Celestin, Univ. Coll. Hosp.; and Eric Clarence Spear, private study.

Branch IV., Midwifery and Diseases of Women.—Grace Stapleton, Lond. Sch. of Med. for Women.

M.S. EXAMINATION.

Branch I., Surgery.—Stanley Ritson, King's Coll. and King's Coll. Hosp.

UNIVERSITY OF MANCHESTER.—At examinations held recently the following candidates were successful:—

FINAL M.B. AND CH.B.

N. H. Davison, Bryan Walley, and Ethel D. Willis.

Forensic Medicine.—May Ashburner, Mary S. Jones, J. N. Laing, and Edme Ratner.

THIRD M.B. AND CH.B. EXAMINATION.

General Pathology and Morbid Anatomy.—Samuel Adler, May Blakiston, J. W. Crawshaw, K. V. Deakin, F. R. Ferguson, Evelyn A. Garrett, E. M. Greaves, G. E. Hayward, Sylvia K. Hickson, J. B. Higgins, F. S. Horrocks, Irma M. C. Jehanssart, F. C. Jones, W. E. Mason (with distinction), Doris B. Norman, E. R. Ormerod, Emily M. Veach, Harry Rosenthal, Gerald Sheehan (with distinction), Constance Snowdon, Annie E. Somerford, G. L. Taylor (with distinction), H. W. Taylor, Henry Tomlinson, Mary I. Turner, F. A. van Coller, Raymond Williamson (with distinction), and J. B. Wright.

DIPLOMA IN DENTISTRY (*Final Examination*).

A. D. Bleakley and Bertram Wilkinson.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At a meeting of the College held on Dec. 18th the following candidates, having passed the requisite examinations between Sept. 30th and Oct. 2nd, were admitted Fellows:—

John Ellison, Robert Joseph English, James Burnett Hogarth, Robert Lyle Hutton, Millen Alexander Nickle, Ibrahim Abdell Razzak, James Ness MacBean Ross, Augustus George Stewart, David Laurence Tate, William Robert Tutt, and Wilson Tyson.

THE amount which the League of Mercy has contributed this year to King Edward's Hospital Fund for London was stated by Lord Farquhar at the annual meeting of the League on Dec. 20th, to be £16,000, in addition to £3392 granted to extra-metropolitan hospitals.

INSTITUTE OF MASSAGE AND REMEDIAL GYMNASTICS.—The annual meeting of this institute was held at the Chartered Accountants' Hall, Manchester, on Dec. 17th, Sir William Milligan, chairman of the executive, being in the chair. He presented a report of the working of the institute during the past 12 months. The institute originated in 1914 and was incorporated in 1916. The negotiations with the Incorporated Society of Trained Masseuses had led to the drafting of a charter which might now be taken as the settled views of the two bodies. This charter was now complete and simply awaited revision by counsel, after which it would be submitted to the Privy Council, and, if accepted by them, would become the charter of a new society arising out of the amalgamation, representative of massage throughout the country. In the meantime the examinations and other activities of the institute had been in abeyance. The charter, when completed, would yield a strong body with a council elected by postal ballot of the whole of the members. On the proposal of Dr. A. E. Barclay, honorary secretary, it was unanimously decided to accept the provisions as laid down in the draft charter.

INFLUENZA IN SOUTH AFRICA.—A South African correspondent, writing on Oct. 29th, says: The influenza epidemic in South Africa has been responsible for about 50,000 deaths during the first month after it broke out, about 10,000 occurring among Europeans, and, as in England, healthy individuals in the prime of life have been most often attacked. Apparently introduced from Europe, it has been attributed to returning South African labour battalions, trench fever, German gas, or deliberate Hun propaganda. The preventive measures which have been taken include the use of gargles, mouth-washes and nasal douches of salt and water, &c., as well as inoculation, which in some places appears to have been of use. In most of the towns drastic precautionary measures have been adopted, including closing of schools, places of entertainment and churches, market halls and auction rooms, as well as the prohibition of public gatherings. The native is an important factor in transmitting infection, and the epidemic is in consequence subsiding more quickly in the towns than in the villages and country. Pneumonia is the usual cause of death. The Cape Peninsula has been severely attacked and the mortality has been high, and, as in other parts of the Union, the railway, postal, and tramway staffs were greatly depleted. As far as the towns are concerned, Cape Town, Kimberley, Johannesburg, and Bloemfontein have suffered most from the scourge.

THE SERVICES.

ARMY MEDICAL SERVICE.

TERRITORIAL FORCE.

Col. W. Coates, C.B. (Retired List, A.M.S., T.F.), to be Colonel.

ROYAL ARMY MEDICAL CORPS.

The undermentioned relinquish the acting rank of Lieutenant-Colonel on re-posting: Major L. V. Thurston; Capts. G. F. Rudkin, R. E. Todd.

To be acting Lieutenant Colonels whilst in command of a Medical Unit: Temp. Capt. (acting Major) H. S. Davidson; Majors H. Harding, C. J. Wyatt, C. W. O'Brien.

Temp. Major F. R. S. Cosens (Lieut.-Col., Devon Regt. T.F.), to be temporary Lieutenant-Colonel.

Temp. Capt. J. Cunningham to be acting Major whilst specially employed.

The undermentioned relinquish the acting rank of Major: Capt. O. W. McSheehy; Temp. Capts. J. F. R. Gairdner, H. C. Wilson, R. B. Rutherford, J. H. Hebb.

Temp. Capts. to be acting Majors: A. A. Miller, M. W. Baker, F. B. Chavasse, J. F. McLay, O. E. Finch, F. R. Fraser, H. L. Tidy, W. P. Box, C. S. Dodson, T. Martin, H. D. Ledward, J. A. Jones, E. T. Willans.

V. H. Kazanjian to be temporary Honorary Major whilst serving with No. 22 General Hospital (Harvard Unit).

Capt. (acting Major) W. B. Allen, V.C., from R.A.M.C. (T.F.), to be Captain.

Lieutenants (temporary Captains) to be Captains: E. Jamieson, J. E. Brooks.

The undermentioned late temporary Captains retain the rank of Captain: R. A. Jones, T. E. Parker.

M. Cohen, late temporary Captain, is granted the rank of Captain.

To be temporary Captains: E. Ashby, F. S. Collard.

Temp. Hon. Lieuts. J. M. Bremner and T. C. Bost to be temporary honorary Captains.

To be temporary Lieutenants: A. A. Angelis, J. T. Rearden, W. J. Lord, H. Caird, J. Grimson, C. L. Lapper, C. J. E. Edmonds, N. J. McCaskie, R. Hamer, J. V. Rees, J. Stewart.

M. M. Stevens to be temporary honorary Lieutenant whilst serving with No. 22 General Hospital (Harvard Unit).

Officers relinquishing their commissions: Temp. Lieut.-Col. F. Romer (on grounds of ill-health, and is granted permission to retain his rank); Temp. Capts. D. A. Stewart, R. V. Steele, F. I. Dawson, W. M. G. Guinness, H. F. Powell, W. M. Penny, G. H. Rodolph (on account of ill-health, and is granted the rank of Lieutenant) W. M. Thomson, S. A. Bull (and is granted permission to retain his rank), E. W. Toumin (on account of ill-health and is granted permission to retain his rank), S. S. King, A. C. Fleming, J. W. O'Farrell, J. F. Powell, W. L. O'Neill, J. D. Ferguson, W. L. Clements, H. C. Wilson, A. Campbell, J. S. Clark, R. B. Rutherford, F. Wilkinson, T. H. Ravenhill, J. C. Wadmore, R. W. Kirk, G. L. N. Miles and F. M. Longson (on account of ill-health, and to retain the rank of Captain), W. H. T. Jones, E. W. Goble, R. J. Duthie, J. Maguire, G. L. Irwin, W. S. Hall, F. G. Wrigley, A. M. Roome, A. R. F. Hay, G. H. G. Davie, L. C. W. Cane, G. E. Thornton, H. Freeth, S. B. Sapwell, R. S. Berry; Temp. Hon. Capt. T. C. Bost; Temp. Lieuts. C. W. Branson, J. Shaw, H. G. Browning, F. A. Hadden (on account of ill-health contracted on active service, and is granted permission to retain his rank), S. McClure, T. McLaren, A. Macintyre.

Canadian Army Medical Corps.

Temp. Major T. A. Lomer, D.S.O., to command a Field Ambulance, and to be acting Lieutenant-Colonel whilst so employed.

Temporary Captains to be acting Majors whilst employed at a Field Ambulance: W. J. MacKenzie, F. F. Dunham.

SPECIAL RESERVE OF OFFICERS.

Capt. R. Magill, D.S.O., relinquishes the acting rank of Lieutenant-Colonel, and reverts to the acting rank of Major.

Capt. W. M. Biden to be acting Major.

Captains relinquishing the acting rank of Major on re-posting: J. W. Gray, R. MacKinnon.

W. V. Robinson, from University of London Contingent, O.T.C., to be Lieutenant.

TERRITORIAL FORCE.

General List.—The undermentioned officers to be acting Majors whilst specially employed: Capts. W. E. Lee, D. A. R. Haddon, H. Shield.

Capts. (acting Majors) J. W. Craven, R. D. Moore, M.C., and A. W. Stott relinquish their acting rank on ceasing to be specially employed.

Capt. J. W. Scott to be acting Major whilst specially employed.

Capt. (acting Major) A. H. Horsfall, from 2nd Northern General Hospital, to be Captain.

Capt. A. H. Horsfall to be Major.

Capt. H. G. W. Dawson to be acting Major, with precedence.

2nd Southern General Hospital: Capt. C. A. Moore to be acting Major whilst specially employed and to remain seconded.

2nd Western General Hospital: Capt. H. Buck to be acting Major whilst specially employed and to remain seconded.

3rd Scottish General Hospital: Major H. Rutherfurd, M.B., is seconded for duty with a General Hospital.

2nd London Sanitary Company: Lieut. A. H. Hasnip to be Captain.

3rd Southern General Hospital: Capt. J. F. Robinson is restored to the establishment.

Sanitary Service: Capt. C. M. Fegen to be acting Major.

2nd London Sanitary Company: Capt. R. T. F. Barnett relinquishes his commission on account of ill-health contracted on active service, and retains the rank of Captain.

Attached to Units other than Medical Units.—Capt. (acting Major) J. W. Scott relinquishes his acting rank on ceasing to be specially employed.

ROYAL AIR FORCE.

Medical Branch.—W. G. L. Wambeek, late temporary Captain, R.A.M.C., is granted a temporary commission as Captain.

F. N. V. Dyer, J. Paxton, and J. Souter (late temporary Surgeons, R.N.) are granted temporary commissions as Captains.

J. B. Barnett and C. H. Young are granted temporary commissions as Lieutenants.

Notes, Short Comments, and Answers to Correspondents.

COLONIAL HEALTH REPORTS.

Hong-Kong.—The estimated population at the middle of 1917 was 535,100. The corrected birth-rate for the year was 6·9 per 1000 among the Chinese community and 20·8 per 1000 among the non-Chinese. The death-rate was 23·7 per 1000 among the Chinese community and 14·0 among the non-Chinese. The number of deaths from malaria (416) showed an increase on the previous year. The deaths of Chinese from this cause in the city of Victoria numbered 185 out of a population of 280,700. The deaths from plague numbered 35, as compared with 39 in 1916. Small-pox deaths numbered 549, all Chinese with the exception of 3 Portuguese and 1 each British, Filipino, and Japanese. There were 2248 deaths from respiratory diseases, 34 of these being among the non-Chinese community. Pulmonary tuberculosis claimed 859 Chinese and 18 non-Chinese victims, whilst other forms of tuberculosis represented an additional 616 deaths, making a total of 1493, or 14·3 per cent. of the total deaths among the community. Beri-beri was responsible for 654 deaths, as compared with 517 during 1916 and 398 in 1915. During the past few years circulars have been distributed to all large employers of coolie labour calling their attention to the fact that beri-beri is produced by the consumption of white rice as the staple article of diet without a sufficiency of other foods, and advising that beans should be supplied with the rice when fresh meat or fresh fish cannot be afforded. At the Civil Hospital 3292 in-patients and 13,065 out-patients were treated during 1917. 361 cases of malarial fever were admitted, as against 360 in 1916 and 384 in 1915, but the total cases of malaria for all hospitals showed a decrease of 34 cases as compared with the year 1916. In the Maternity Hospital there were 309 confinements. In the Victoria Hospital for Women and Children 147 patients were treated. At Kennedy Town Infectious Diseases Hospital 31 cases of small-pox were admitted. In the Tung Wa Hospital only Chinese are treated. Various other services not appertaining to a hospital are performed by the institution, such as the free burial of the poor, the repatriation of destitutes, and the organisation of charitable relief in emergencies. Chinese as well as European methods of treatment are employed in accordance with the wishes expressed by the patients or their friends. About half the number are now treated by Western methods. There are 323 beds in the buildings and 5352 patients were accommodated during 1917. The Tung Wa also maintain a branch hospital for small-pox cases (Chinese only) at Kennedy Town; it contains 58 beds and 146 cases were treated. The Alice Memorial and Affiliated Hospitals are managed and controlled by the missionaries resident in Hong-Kong, agents of the London Missionary Society, and consist of the Alice Memorial Hospital, the Nethersole Hospital, the Alice Memorial Maternity Hospital, and the Ho Miu Ling hospital. The in-patients in 1917 totalled 1670; the number of labours in the Maternity Hospital was 590. The new Kwong Wa Hospital for Chinese in the Kowloon Peninsula contains 70 beds and 2388 patients were accommodated during 1917.

THE "LIMPET" SYSTEM OF ELECTRODES.

OUR attention has been called to an invention which enables medical men to make their own electrodes in any required shape and, by means of a non-absorbent a-eptic fastening, to apply and fix the electrode at any desired spot on the patient. The complete outfit consists of nine rubber belts of different sizes and two terminal attachments for placing beneath the belt after the electrode, which is cut by the operator from non oxidisable plastic metal, has been fixed in position. The chief advantage claimed for the system is that the terminal does not break away by use and so render the whole electrode valueless. The manufacturers are the Medical Supply Association, 167-185, Gray's Inn-road, W.C.1.

DISABLED OFFICERS' HOME AND CLUB; SEASIDE BRANCH AT FRINTON.

THE Home and Club founded by Miss Phyllis Holman, and privately endowed, has now been established on permanent lines. Residence is provided for 25 discharged officers with 100 per cent. disability who require medical or nursing attention or the services of orderlies, and who are unable to take up remunerative work. Contribution of 1-2 guineas a week is made towards the running expenses, according to individual circumstances. The remaining two-thirds of the cost is covered by private endowment and by an agreement with the Pensions Ministry in regard to individual cases requiring continual treatment. Dr. F. E. Easton is honorary medical officer, and Sir George Makins, Sir David Ferrier, Professor F. W. Mott, F.R.S., Mr. J. P. Lockhart-Mummery, and Dr. R. Riddoch are acting as consultants.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary & Cardiganshire General Hospital.—H.S. £200.
Alton, Hants, Lord Mayor Treloar Cripples' Hosp.—Asst. Res. M.O. £200.
Brighton, Royal Sussex County Hospital.—Asst. Path. £200.
Buxton, Derbyshire, Devonshire Hospital.—Asst. H.S. £120.
Glamorgan County Asylum, Bridgend.—Temp. Asst. M.O. £6 6s. per wk.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. 30 guineas.
Hospital for Sick Children, Great Ormond-street, London.—H.S. £100.
Leicester Borough Mental Hospital, Humberstone.—Locum Tenens M.O. 7 gs. per week.
London County Mental Hospitals.—Temp. Asst. M.O.'s. 7 gs. per week.
Manchester and Salford Lock Hospital.—Female Clin. Asst.
Montgomeryshire Education Committee.—School Dentist. £400.
National Hospital for Diseases of the Heart.—Non-Res. M.O.
Plymouth, South Devon and East Cornwall Hospital.—M.O. £350. Also H.S. £250.
Prison Commission.—Two Female Doctors. 7 gs. per week.
Putney Hospital, Lower Common, S.W.—Res. M.O. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Female Asst. Anæs. £50.
Salisbury General Infirmary.—Asst. H.S. £150.
Southampton Free Eye Hospital.—Asst. Oph. Surg. £100.
Whitehaven and West Cumberland Infirmary.—Res. H.S. £150 to £180.
Winchester, Royal Hampshire County Hospital.—Jun. Res. M.O. £250.

Births, Marriages, and Deaths.

BIRTHS.

HALL.—On Dec. 15th, at a nursing home, to Margaret, wife of Major G. Hall, C.M.G., R.A.M.C.(T.), 9, Ellison Place, Newcastle-on-Tyne—a daughter.

UNDERWOOD.—On Dec. 10th, at Welford, Rugby, the wife of Dr. F. L. Underwood, of a son.

DEATHS

HAMILTON.—On Dec. 20th, after long illness, Thomas Hamilton, M.B., F.R.C.S.E.

JOHNS.—On Dec. 16th, at Leeds-road, Harrogate, Dr. Frederick Arthur Johns, M.B. Lond., aged 45 years.

LANGFORD.—On Dec. 15th, at the 84th Military Hospital, Dar-es-Salaam, from influenza, Surgeon Lieutenant-Commander Martyn Henry Langford, D.S.O., R.N., H.M.S. *Challenger*, aged 34.

ROWLAND.—Killed in action in France, on Nov. 1st, Second Lieutenant John W. B. Rowland, Royal Field Artillery, D 175 Army Brigade, British Expeditionary Force, France, only son of Dr. H. D. Rowland I.S.O., Colonial Medical Service, British Guiana, Georgetown, Demerara, aged 19 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Communications, Letters, &c., to the Editor have been received from—

A.—Col. J. G. Adami, A.D.M.S., Mr. R. J. Albery, Lond.; Surg.-Lieut. D. K. Adams, R.N.; Dr. C. J. H. Aitken; Mr. E. A. Armstrong, Lond.

B.—Dr. T. H. Brown, Lond.; Board of Agriculture and Fisheries, Lond.; Dr. W. Langdon Brown, Lond.; Prof. W. A. Bone, Lond.; Sir James Barr, Liverpool; Dr. G. M. Basaett, Carnarvon; Surg.-Capt. P. W. Bassett-Smith, C.B., C.M.G., R.N. Capt. P. Bahr, R.A.M.C.; Mrs. C. Brereton, Lond.

C.—Dr. H. Campbell, Lond.; Mr. R. W. Cockburn, Edinburgh; Mr. F. E. Coe, Lond.; Capt. H. R. Carter, R.A.F.; Lieut.-Col. A. Castellani. Dr. H. P. Chumeley, Forest Row, Clerical, Medical, and General Life Assurance Society, Lond.

D.—Dr. R. Donaldson, Reading; Dr. J. Donelan, Lond.

E.—Dr. A. Evans, Swansea; Eugenics Record Office, Cold Spring Harbour.

G.—Major E. B. Gunson, R.A.M.C.; Lieut.-Col. E. W. Goodall, R.A.M.C.; Dr. M. Greenwood, Loughton; Mr. H. E. Girdlestone, Petersfield; Dr. G. F. Grant, Lond.

H.—Miss P. H. Holman, Lond.; Messrs. Hodder and Stoughton, Lond.; Hong-Kong, Colonial Secretary of. Capt. A. Harwood. Mr. J. T. Henderson, Pietermaritzburg.

I.—Dr. S. T. Irwin, Belfast; Dr. H. Ingleby, Lond.; Institute of Massage and Remedial Gymnastics, Manchester.

J.—Mr. F. Jenner, Boscombe; Dr. G. Jessel, Wigan; Capt. W. H. Johnston, R.A.M.C.

K.—Dr. A. J. Knox, Lond.; King Edward's Hospital Fund for London.

L.—Mr. E. M. Little, Lond.; Major H. Leigh, R.A.M.C.

M.—Col. G. R. Murray, A.M.S.; Dr. N. Macleod, Shanghai Surg.-Com. C. W. Morris R.N. *Medical Journal of South Africa*, Johannesburg, Sec. of; Ministry of Food, Lond.

N.—Newspaper Proprietors Association, Lond.

O.—Sir William Osler, Bart., Oxford.

P.—Major J. Phillips, R.A.M.C.; Dr. H. R. Prentice, Lond.

Q.—Mr. J. H. Quastel.

R.—Royal Society, Lond.; Lieut.-Col. J. W. F. Rait, I.M.S.; Mr. H. M. Rainsford, Lond.; Royal Statistical Society, Lond.; Dr. C. Riviere, Lond.; Royal Academy of Medicine in Ireland, Dublin; Royal Sanitary Institute, Lond.; Lady Roberts, Lond.

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T.—Dr. C. J. Thomas, Lond.; Mr. L. L. Thain, Gloucester.

U.—University of Manchester.

W.—Dr. H. E. Whittingham.

Y.—Dr. R. A. Young, Lond.

Communications relating to editorial business should be addressed exclusively to The Editor of THE LANCET, 423, Strand, London, W.C. 2

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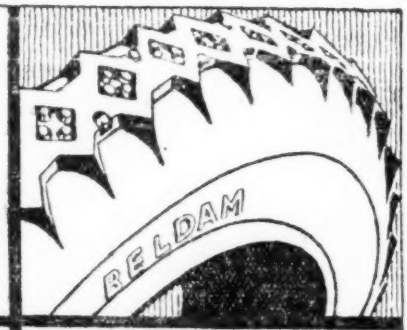

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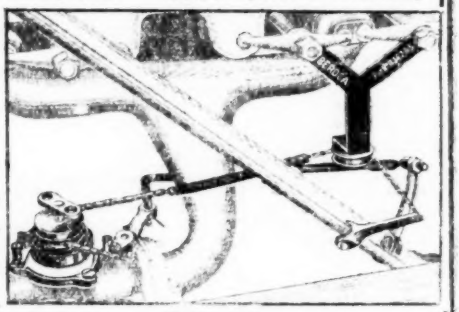

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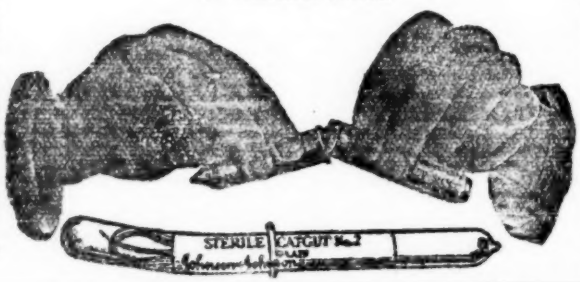

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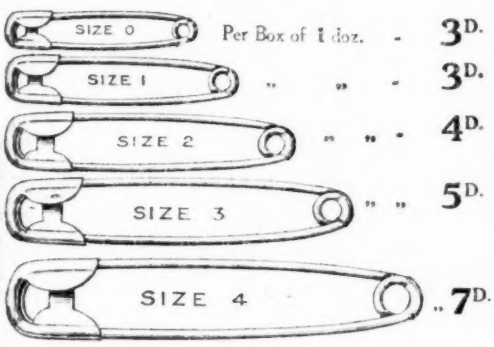

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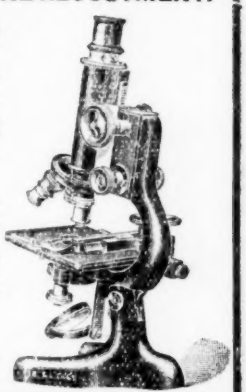

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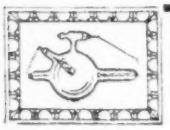

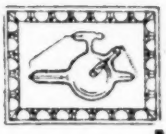

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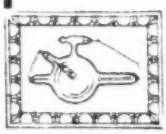

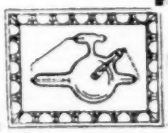

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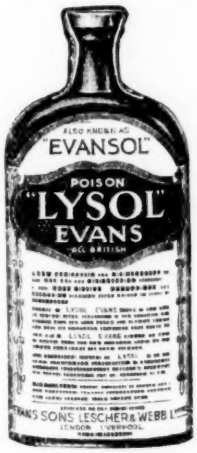

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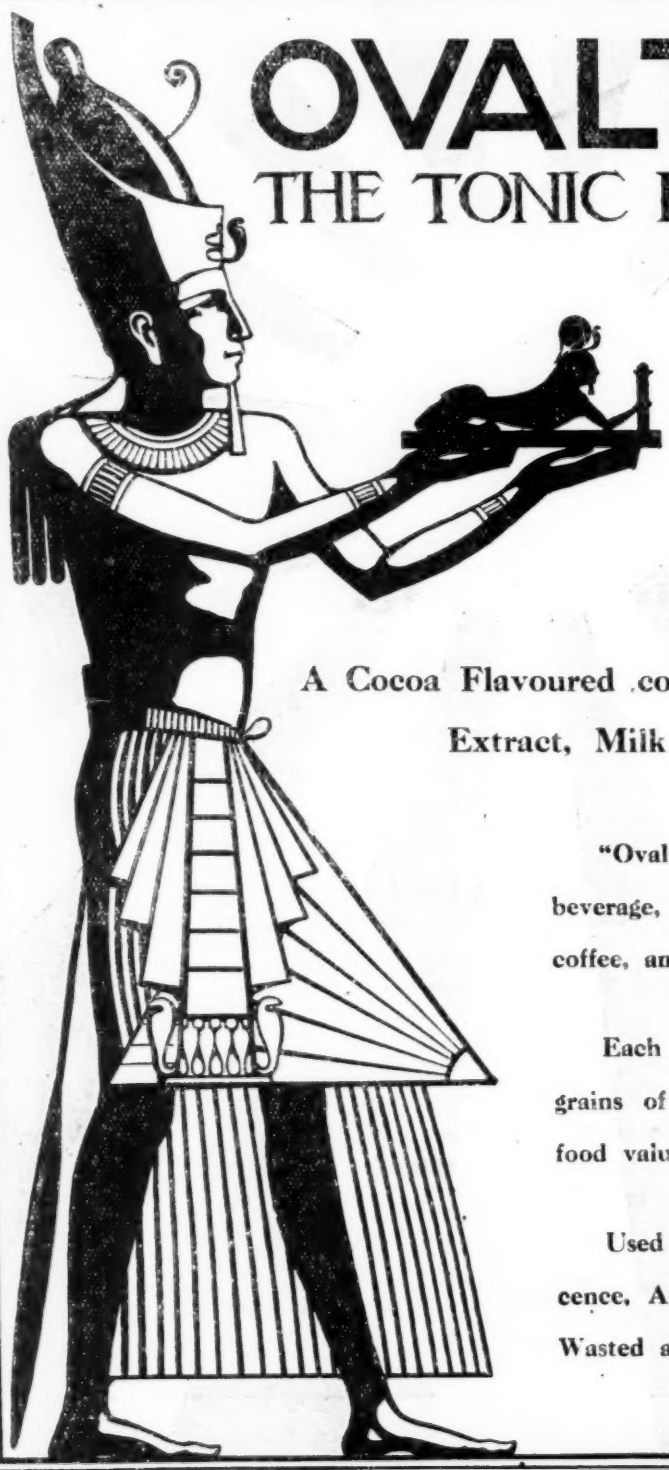

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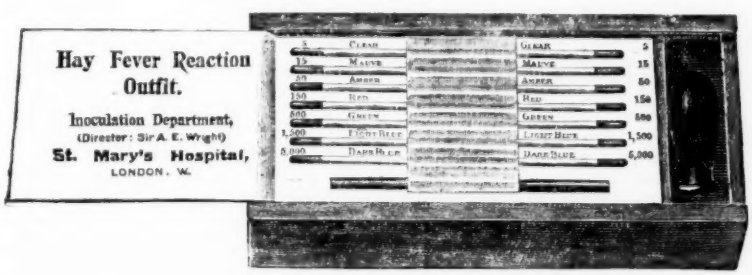

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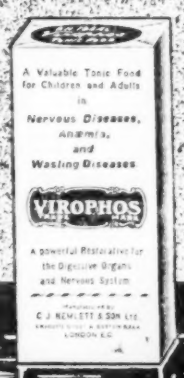

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IN
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Recent research work (in particular that of Champy) showed that embryo tissue, when transplanted in plasma outside the organism, took on new growth. Embryonic connective tissue could be subcultured very many times since it grew so rapidly. Adult tissue when transplanted *in vitro* produced mitotic figures, and embryonic cells were split off. What prevents these embryonic cells in adult tissue from growing in the normal body is at present unknown, but there is evidently a restraining influence, and this influence is said to be a sufficiency of oxygen. In malignant disease this is absent—hence the abnormal growth.

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COLLOSOL CUPRUM is supplied in Ampoules (3 c.c.) 6 at 4 -,
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FORMULA:

Quinine Phosphate	**1½ grains.**
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"Bynin," Liquid Malt	**1 ounce.**

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Peristaltine is not to be confused with so-called "aromatic" or "tasteless" cascara extracts of inconstant activity.

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In chronic constipation: 1 tablet 2 to 4 times a day.
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PERISTALTINE "Ciba" tablets, ⅔ grains, in tubes of 20 tablets.
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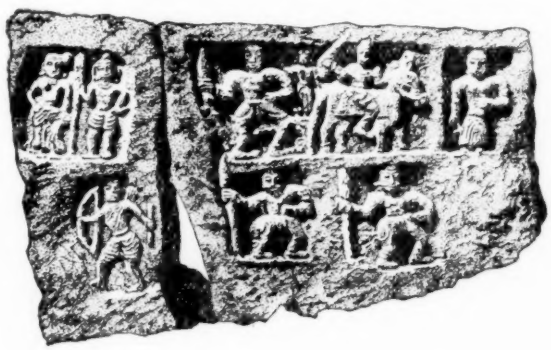

FIGURES OF WARRIORS CARVED UPON A CROMLECH IN SOUTH INDIA.—This cromlech marked the spot where fell some local hero of the aboriginal tribes. In the upper register on the left is the hero with his wife, who committed suttee at her husband's funeral. He carries a spear, and the lobes of his ears are artificially lengthened—a mark of distinction. Beneath is a bowman whose quiver is fastened behind his left shoulder by a strap across his breast. Each warrior on the right-hand stone is armed with either a sword or a spear; one is on horseback. These primitive fighters, with their few and rude weapons, form the strongest contrast to the magnificently equipped mailed warriors of the Mahommedan and Hindu armies of Northern India with whom they were contemporary. Date: A.D. 1500-1600.

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marks a new departure in the treatment of Chronic Constipation, etc. It presents 50 per cent. by volume of "Chrismol," a specially selected and purified Russian mineral oil in intimate combination with the "Allenburys" Malt Extract.

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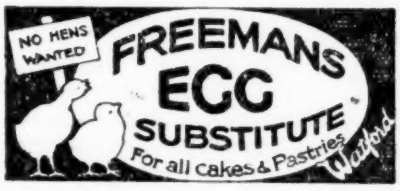

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PENSIONERSHIPS.

*Thomas, Margaret	4019
†McCalman, Jeannette M....	3961
†Samuel, Louisa	3863
†Morgan, Catherine...	3076

* Burney Yeo Pensioner. † Ordinary Pensioners.

FOUNDATION SCHOLARSHIPS.

Bucknall, Rupert V.	13,483
Martineau Alfred R.	7385
Cooper, Peter A.	6050
Thomas, Granville N. E.	5969
Seal, Arthur M. B.	4953

J. BERNARD LAMB, Secretary.

37, Soho-square, W. 1, June 28th, 1918.

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Resident Physician—GILBERT R. MOULD, L.R.C.P., M.R.C.S. Consulting Physician—CROCHLEY CLAPHAM, M.D., F.R.C.P.E.

EPILEPSY.

The David Lewis Colony has accommodation for Epileptic Patients of Good Social Position for Gentlemen and Ladies in special houses at the Colony—for Boys at COLTHURST HOUSE SCHOOL.
Terms for Ladies and Gentlemen from 32s. a week. Boys at the rate of 38s. a week.
For further information apply to the Resident Medical Superintendent, David Lewis Colony, near Alderley Edge, Cheshire.

WYE HOUSE, BUXTON.

FOR LADIES AND GENTLEMEN MENTALLY AFFLICTED.

Situated 1200 feet above sea level. Facing south.
For terms, &c., apply to the Res. Med. Superintendent, W. W. HORTON, M.D.
[NAT. TEL. 130.

CLARENCE LODGE

CLARENCE ROAD, CLAPHAM PARK.

Stations: Clapham Road and Clapham Common.

A Licensed Home for Mental and Nervous Patients

Twelve Ladies only received for treatment under eminent Specialist and given individual care and the comforts of their own homes. Suitable cases received as voluntary boarders. The house is surrounded by well-wooded grounds; shady lawns for tennis, croquet, &c.
Associated Rooms, Private Rooms, or Suites. Very moderate terms.
Illustrated Prospectus from Resident Licensee, Mrs. THWAITES
Telephone: 494 Brixton

ST. ANDREW'S HOSPITAL

FOR MENTAL DISEASES,
NORTHAMPTON.

President—The Right Hon. the EARL SPENCER, K.G.

This Registered Hospital receives for treatment PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES of both Sexes. The Hospital, its branches (including a Seaside Home at Llanfairfechan, North Wales), and its numerous Villas are surrounded by nearly a thousand acres of Park and Farm.
Voluntary Boarders without certificates received.
For particulars apply to DANIEL F. RAMBAUT, M.A., M.D., the Medical Superintendent. TELEPHONE No. 56

SPRINGFIELD HOUSE

Near BEDFORD (Telephone No. 17)

A PRIVATE HOME for MENTAL CASES

Terms from 3½ guineas per week.

Apply to DAVID BOWER, M.D.

ASHWOOD HOUSE

KINGSWINFORD, STAFFORDSHIRE.

An old-established home-like Institution for the treatment of MENTAL AFFECTIONS in BOTH SEXES.
Full particulars as to reception, terms, &c., may be obtained from the Resident Medical Officer.

VALE OF CLWYD SANATORIUM

This Sanatorium (opened 1901) is established for the Treatment of Tuberculosis as carried out by Dr. OTTO WALTHER of Nordrach. It is situated in the midst of a large area of park-land, at a height of 450 feet above the sea-level, on the western slopes of mountains rising to over 1800 feet, which protect it from North and East winds and provide many miles of carefully graduated uphill walks—similar in character and extent to those at Nordrach.

Small rainfall. Porous subsoil. Large amount of sunshine. Electric Lighting and Hot Water Radiators in each room.

For particulars apply to Resident Superintendent, Llanbedr Hall, Ruthin, North Wales.

MENDIP HILLS SANATORIUM, FOR THE OPEN-AIR TREATMENT.

Old-established, beautifully situated. 300 acres of Sanatorium grounds. Pinewoods and sheltered avenues. Altitude 850 feet. Porous subsoil. Separate chalets, with verandahs, hot-water radiators, and electric light. Special features—breathing and graduated exercises, and continuous inhalation. Individual attention. *Resident Physician*—C. MUTHU, M.D., M.R.C.S., L.R.C.P.

Terms from 3½ guineas weekly. For particulars, apply SECRETARY, Hillgrove, Wells, Somerset.

PENDYFFRYN HALL SANATORIUM

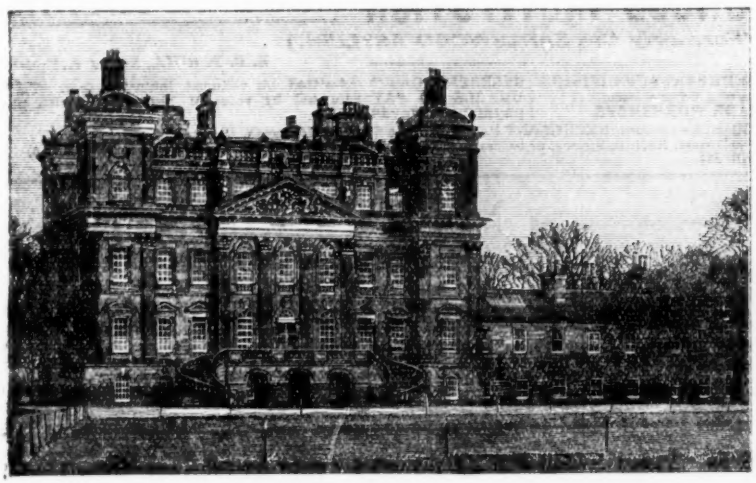
(NORDRACH-IN-WALES.)

Physicians: Dr. G. M. DOBSON and Dr. GERATY.

FOR THE OPEN-AIR AND INOCULATION TREATMENT OF ALL FORMS OF TUBERCULOSIS.

One of the first Sanatoria opened in the United Kingdom to carry out the treatment as practised at Nordrach. Carefully graduated walks rise through pine, gorse, and heather to a height of over 1000 feet above sea level, commanding extensive views of both sea and mountains. Sheltered from E. and N.E. winds. Climate mild and bracing. Small rainfall. Large average of sunshine. There are over five miles of walks in the private grounds. Rooms heated by hot-water radiators and lit by electric light.

Telegrams: Pendyffryn; and Telephone: 20 Penmaenmawr. Apply, Secretary, Pendyffryn Hall, Penmaenmawr, North Wales.



DUFF HOUSE, BANFF, SCOTLAND.

TREATMENT OF DISORDERS OF THE STOMACH AND INTESTINES, DIABETES,

and other complaints which need skilled chemical investigation and dietetic treatment.

The House is fitted with Laboratories, X-Ray Installation, Medical Baths, Central Heating, and Lifts.

The climate is mild, and the rainfall the lowest in Scotland.

Apply,
The Secretary,
Duff House,
Banff.

DROITWICH BRINE BATHS WARNING.

The Public are warned that the full benefits of the treatment for Rheumatism and kindred complaints CAN ONLY BE OBTAINED IN THE NATURAL BRINE BATHS AT DROITWICH, FOR WHICH THERE IS NO SUBSTITUTE. LOVELY HOLIDAY DISTRICT. GOOD HOTELS, &c. Illustrated Booklet Post-free from Baths Manager, J. H. HOLLYER, 46, Spa Enquiry Offices, Droitwich (Worcs.). SPECIAL FACILITIES TO MEDICAL MEN.

WOODHALL SPA

LINCOLNSHIRE.

The celebrated Bromo-Iodine Mineral Water for Arthritis, Rheumatism, Gout, Neuritis, Sciatica, and Nervous Diseases, Liver Complaints; Skin, Nose and Throat Affections; Uterine Inflammatory Diseases and Tumours. To be had of all Chemists or direct from the Springs. Apply to the Secretary, Woodhall Spa Co. Ltd., Woodhall Spa, Lincs.

THE SPA BATHS

Are now open. Fully equipped with Mineral Water, Air and Vichy Douche; Vapour, Radiant Heat and Light Baths; Fango Treatment, Throat Sprays, Cataphoresis, Schnee Baths, Bergonie Treatment for Obesity, and complete Electrical Treatment. Full particulars from the Medical Superintendent. Telephone 50.

THE VICTORIA HOTEL

This premier Hotel adjoins the Baths, and comprises 160 Rooms, numerous Suites, &c. Special Diets, Electric Light, Orchestra, Tennis, Croquet, and Bowls. Excellent 18-hole Golf Course. Hotel and Baths stand in own grounds and Pine Woods of 60 acres. For terms apply to the Manager. Telephone 25.

NORTHUMBERLAND HOUSE,

Telegrams: "SUBSIDIARY, LONDON." GREEN LANES, FINSBURY PARK, N. Telephone: No. 888, North.

(Established 1814.)

A PRIVATE HOME for the Treatment of Ladies and Gentlemen suffering from Nervous and Mental Affections. Four miles from Charing Cross; easy of access from all parts.

Six acres of ground, highly situated, facing Finsbury Park.

Voluntary Boarders received without certificate. Seaside Branch at Worthing.

For particulars, apply to the RESIDENT PHYSICIAN

NEW SAUGHTON HALL

PRIVATE HOSPITAL FOR THE TREATMENT OF NERVOUS AND MENTAL CASES

POLTON, MIDLOTHIAN.

NEW SAUGHTON HALL, which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres. There is also a SEASIDE HOUSE at GULLANE, EAST LOTHIAN.

Railway Stations—Polton, five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. Telephone—4 Loanhead.

Forms of admission for voluntary or certified cases, full instructions, &c., can be obtained on application to the Resident Medical Superintendent, J. BATTY TUKE, M.D. Inclusive terms from £84 to £400 per annum, according to requirements.

THE ROYAL EARLSWOOD INSTITUTION FOR MENTAL DEFECTIVES.

(Formerly the EARLSWOOD ASYLUM.)

REDHILL, SURREY.

E. C. P. HULL, Esq., J.P., Treasurer.

FOR THOSE REQUIRING CONTROL with EXPERT SUPERVISION and needing SPECIAL TRAINING in useful occupations. SCHOOLS, FARMING, and various TRADE WORKSHOPS.

SELECTED CASES admitted on reduced inclusive fees. THOSE UNABLE TO PAY admitted by votes of Subscribers, with part-payment towards cost.

RECREATIONS: ALL outdoor games, EXCELLENT BAND by Male Staff, for Concerts, Dancing, &c.

Apply: THE MEDICAL SUPERINTENDENT, Earlswood, Redhill, Surrey, or to the Secretary, Mr. HARRY HOWARD, 14-16, Ludgate Hill, E.C. 4.
Telephone: Redhill. 344. Telephone: City 5297

NORTHWOODS HOUSE

WINTERBOURNE, near BRISTOL.

FOR PRIVATE TREATMENT OF MENTAL DISEASES.

Situated in a large park in a healthy and picturesque locality, easily accessible by rail via Bristol, Winterbourne, Patchway, or Yate Stations. Uncertified Boarders received. For further information see Medical Directory, page 2053. Terms moderate.

Apply to Dr. J. D. THOMAS, Resident Physician and Licensee, for full particulars.

CAMBERWELL HOUSE, 33, PECKHAM ROAD, S.E.

Telegrams: "PSYCHOLIA, LONDON." Telephone New Cross 1057.

For the Treatment of Mental Disorders.

Completely detached Villas for Mild Cases. Voluntary Boarders received. 20 acres of grounds. Cricket, tennis, croquet, squash racquets bowls, and all in-door amusements. An Illustrated Prospectus, giving full Particulars and Terms, may be obtained on application to the Secretary Senior Physician: FRANCIS H. EDWARDS, M.D., M.R.C.P.

HOVE VILLA, BRIGHTON—A Convalescent Branch of the Above.

HAYDOCK LODGE, Newton-le-Willows, LANCASHIRE.

A PRIVATE MENTAL HOSPITAL FOR THE CARE AND TREATMENT OF MENTAL AND NERVOUS CASES OF BOTH SEXES EITHER VOLUNTARY OR UNDER CERTIFICATES, preference being given to Recoverable Cases.

Terms from £2 2s. per week upwards. Private Apartments on special terms.

Situated mid way between Manchester and Liverpool. Two miles from Newton-le-Willows Station on the L. & N.W.Rly., and close to Ashton-in Makerfield station on the G.C.Rly. in direct communication with Manchester.

CONSULTING ROOMS (Dr. Street), 47, Rodney Street, Liverpool, from 2 to 4 P.M., or by appointment. Telephone: 2458 Royal Liverpool. Manchester (Dr. Mould), Winter's Buildings, St. Ann Street, on Tuesdays and Thursdays, from 12 to 1.30 P.M., or by appointment.

VISITING AND CONSULTING PHYSICIANS.—Sir JAMES BARR, LL.D., M.D., F.R.C.P., 72, Rodney Street, Liverpool; W. B. WARRINGTON, M.D., F.R.C.P., 85, Rodney Street, Liverpool; G. E. MOULD, Physician for Mental Diseases to the Sheffield Royal Hospital, The Grange, Rotherham.

For further particulars and forms of admission apply Resident Medical Proprietor, Haydock Lodge, Newton-le-Willows, Lancs.

Telegraphic Address: "STREET, Ashton-in-Makerfield." Telephone: 11 Ashton-in-Makerfield.

PECKHAM HOUSE (Established 1826)

112, PECKHAM ROAD, LONDON, S.E.

Telegrams: "Alleviated, London." Telephone: New Cross 576.

An Institution licensed for the CARE and TREATMENT of the MENTALLY AFFLICTED of Both Sexes. Conveniently situated. Electric trams and omnibuses from the Bridges and West-End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday parties sent to the Seaside branch at Worthing during the Summer months. Moderate terms.—Apply to Medical Superintendent for further particulars.

The Medical Man himself, in need of rest, might well benefit by the waters of one of these Famous British Spas.

BATH
Hot Mineral Springs

BUXTON
The Mountain Spa

CHELTENHAM
The Spa in the Cotswolds

DROITWICH
Natural Brine Baths

HARROGATE
87 different Natural Waters

WOODHALL SPA
Bromo-Iodine Waters

At the same time, he would gather invaluable evidence of the growing importance of the hydrological, climatological, and various physical treatments as now practised here.

The treatment of the invalided wounded is, perhaps, one of the most striking achievements of these Spas during the past two years; but in digestive, gouty, and rheumatic disorders, also, advances have been made of a scientific accuracy that promises well for all future treatment of disease.

Particulars of any Spa will be forwarded by the Spa Manager at that Spa or of all the Six Famous British Spas by F. J. C. BROOME, Spa Federation Secretary, HARROGATE.

P.C.B.—12

MATLOCK SANATORIUM

Situated on the edge of the mountain limestone area of Derbyshire, over 700 feet above sea-level. The buildings face south and command beautiful views, while on the north and east they are sheltered by lofty hills. The surrounding country is well known for its great beauty and interest. The climate is dry and bracing. The buildings are lighted by electricity and heated by radiators.

Treatment is carried out on modern lines, all special methods being available in suitable cases. A new X-ray apparatus has been installed, and there is a complete equipment for the carrying out of up-to-date methods in all Tubercular and other Pulmonary cases.

For particulars apply to FREDERICK KINCAID, M.R.C.S., L.R.C.P., Medical Superintendent, Matlock Sanatorium, Matlock, Derbyshire. Telephone and Telegraph: SANATORIUM, MATLOCK 22.

INEBRIETY.

[Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars, apply to F. S. D. HOGG, M.R.C.S., &c., Resident Medical Superintendent.

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M. (Edin.)

Prospectus and full information on application to Managing Director.

For COMFORT and HEALTH Visit

THE CATERHAM SANITARIUM

"Battle Creek System."

Telephone: 88.
Telegrams: "HYDRO, CATERHAM."

Resident Physician:
A. B. OLSEN, M.D., D.P.H.

Telegraphic Address:
"Relief, Old Catton."

Telephone:
"290 Norwich."

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates. Nurses supplied to take charge of patients under the care of their own medical attendants. For full particulars apply to the Misses MCLINTOCK, or to CECIL A. P. OSBURNE, F.R.C.S.E., Medical Superintendent.

STRETTON HOUSE,

Church-Stretton, Shropshire.

A Private HOME for the treatment of Gentlemen suffering from Mental Diseases. Bracing hill country. See "Medical Directory," p. 2119. Apply to Medical Superintendent. Telephone: 10 P.O. Church-Stretton.

Resident Patients.—Descriptive List

(Illustrated) of Medical Men in all parts willing to receive Resident Patients sent without charge. Or selection will be made on statement of nature of case and terms to the General Manager, Scholastic, Clerical & Medical Assn., Ltd., 22, Craven-street, Trafalgar-square, W.C.2.

IN BEAUTIFUL COUNTRY, 18 MILES FROM LONDON.

Littleton Hall, Brentwood, Essex

(400 feet above sea-level). A HOME for a few LADIES Mentally Afflicted. Large grounds. Liverpool-street half an hour. Stations: Brentwood one mile; Shenfield one mile. Voluntary Boarders received. Vacancy.—For terms, &c., apply Dr. Haynes, Telephone and Telegrams: Haynes, Brentwood 45.

Brighton. — Charming Residence

(4 acres pleasure grounds). — Massage, Electrical, Nervous Diseases, Chronic, Convalescent, and Rest Cure cases received. Bungalow in grounds. Suitable for any case.—Dr. Holmes Meyrick, Sylvan Hall, Upper Lewes-road. Telephone: 362 Brighton.

THE WARNEFORD, OXFORD

HOSPITAL FOR MENTAL DISORDERS.

President: The Right Hon. the EARL OF JERSEY.

This Registered Hospital, for the Treatment and Care, at moderate charges, of Mental Patients belonging to the educated classes, stands in a healthy and pleasant situation on Headington Hill, near Oxford. Voluntary boarders are also received for treatment.—For further particulars apply to the Medical Superintendent.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

PORTSMOUTH CORPORATION MENTAL HOSPITAL

Provision for PRIVATE PATIENTS has just been provided in two detached Villas.

Inclusive charges from £1 11s. 6d. per week.

Apply to the Medical Superintendent.

BARNWOOD HOUSE HOSPITAL FOR MENTAL DISEASES BARNWOOD, near GLOUCESTER

Exclusively for private Patients of the Upper and Middle Classes. This institution is devoted to the Care and Treatment of persons of both sexes at moderate rates of payment. Under special circumstances the rates of payment may be reduced by the Committee. For further information apply to J. G. SOUTAR, M.B., the Med. Supt. [Tel. No. 7

THE MOAT HOUSE, TAMWORTH, STAFFORDSHIRE

Stations: L. & N. West. and Mid. Railways.

The House is devoted to the care and treatment of a few Ladies suffering from Nervous and Mental Affections, who enjoy the comfort, privacy, and occupations of home life. For terms, &c., apply to the Resident Licensees, EDWARD HOLLINS, M.A. Cantab., or (Mrs.) S. A. MICHAUX.

THE COPPICE, NOTTINGHAM. HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. the EARL MANVERS.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted.

For terms, &c., apply to the Medical Superintendent

HOME FOR FEEBLE-MINDED, BRUNTON HOUSE, LANCASTER.

There are now a few vacancies in this well-appointed private establishment. It is easily accessible from Lancaster, overlooks Morecambe Bay, and possesses extensive gardens and grounds, with tennis and croquet lawns. Varied scholastic and manual instruction. Individual attention is given to pupils by experienced staff under a Resident Physician and Lady Matron. Terms on application to Dr. W. H. COUPLAND.

BISHOPSTONE HOUSE, BEDFORD.

Telephone 708.

Private Home for Mentally afflicted Ladies; ten only received. Terms from 4½ gns. weekly.

Apply, Medical Officer, or Mrs. Poole.

Cheltenham Eye, Ear, and Throat

FREE HOSPITAL.—Post of NON-RESIDENT ASSISTANT SURGEON will be vacant on August 1st. Salary £300. Knowledge of diseases of eye, ear, and throat necessary. Qualified Lady eligible. Apply, stating qualifications, to the Honorary Secretary.

Liverpool Stanley Hospital.—

The Committee invite applications for the post of RESIDENT MEDICAL OFFICER, who must be fully qualified and on the Register. Candidates (either sex) will submit copies of three recent testimonials, stating essential particulars. Rooms, board, and laundry provided. Duties to commence July 8th next.

FRANK WHITE, Hon. Secretary.

The Royal Infirmary, Sheffield (363

beds, of which 133 are Military).—Wanted, a HOUSE SURGEON (Male, ineligible for Military Service, or Female), who must be fully qualified and registered.

Salary £120 per annum, with board and residence, rising after three months to £150.

Applications, with copies of recent testimonials, to be addressed to me immediately.

By order,
JNO. W. BARNES, Secretary.

Queen Charlotte's Lying-in Hospital,

Marylebone.—PHYSICIAN in Charge of Ante-Natal Department.—The Committee of Management invite applications for the appointment of Physician in Charge of the Ante-Natal Department. Candidates (Male or Female) must be Graduates in Medicine of a University of the United Kingdom, or (a) Fellows or Members of the Royal College of Physicians of London, or (b) Fellows of the Royal College of Surgeons of England.

Applications should be sent to the undersigned, from whom further particulars may be obtained.

24th June, 1918. ARTHUR WATTS, Secretary.

The Italian Hospital.—Applications

are invited for the post of HOUSE SURGEON from 1st August next. Candidates must be doubly qualified and registered. The appointment will be for six months, renewable at the pleasure of the Committee of Management. Salary £150, board and residence.

Applications, with copies (only) of testimonials, should be forwarded to the Secretary, Italian Hospital, Queen-square, London, W.C. 1, on or before Wednesday, 10th July next.

Derbyshire Royal Infirmary, Derby.

—There is a vacancy for a HOUSE SURGEON. Candidates must be qualified and registered under the Medical Acts.

Salary £200 per annum, with board, residence, &c.

Male applicants should be inelig ble for Military Service.

The Hospital contains 367 beds of which 170 are reserved for Soldiers.

By order.
25th June, 1918. WALTER BANKS, Superintendent.

Hospital for Consumption and

DISEASES of the CHEST, Brompton. — The Committee of Management invite applications for the post of HOUSE PHYSICIAN. The duties include work in the Out-patient Department as well as in the Wards. Further particulars may be obtained from the undersigned, to whom applications, with testimonials, should be addressed. The appointment is for six months, with an honorarium of 30 guineas.

Applications received from qualified Medical Women.

May, 1918. FREDERICK WOOD, Secretary.

Bristol Royal Infirmary.—Applica-

tions are invited for appointments of HOUSE PHYSICIAN and HOUSE SURGEON.

The appointments will be made subject to the terms and conditions of the War Office Scheme for granting commissions in the R.A.M.C., for which the successful candidates will be eligible.

Applications also considered from those ineligible for Military Service.

Salary at the rate of £120 per annum, with board, apartments and laundry.

Candidates must possess registered Medical and Surgical qualifications.

For all particulars and conditions governing these appointments, apply to the undersigned, to whom applications, accompanied by copies of testimonials, should be sent immediately.

W. E. BUDGETT, Secretary & House Governor.

19th February, 1917.

Lincoln General Dispensary. —

Wanted, a RESIDENT MEDICAL OFFICER, Male or Female, and unmarried. Candidates must be qualified to practise Medicine and Surgery, and be duly registered.

Salary £400 per annum, with furnished apartments, housekeeper, fire, and lighting provided.

The duties are to attend the sick poor in their own homes in the City of Lincoln and suburbs, and to prescribe for such patients.

There are no beds for patients in connexion with the Institution. About 90 per cent. of patients are women and children.

A Dispenser and Nurse are kept.

The person appointed will be required to enter upon the duties as soon as possible after the election, and give one month's notice prior to leaving.

Applications, stating age, with copies of three recent testimonials (which will not be returned), are to be sent to me on or before Thursday, 11th July, 1918.

2, Bank-street, Lincoln, 25th June, 1918. R. H. LYNN, Secretary.

Royal Free Hospital, Gray's Inn-road, W.C.

—Applications are invited from duly qualified and registered Medical Women for the posts of HOUSE PHYSICIAN, CASUALTY HOUSE SURGEONS, and GYNÆCOLOGICAL REGISTRAR.

Applications, with copies of testimonials, to be sent to the Secretary on or before July 13th, 1918.

Birmingham and Midland Ear and Throat Hospital, Edmund-street, Birmingham.

—CLINICAL ASSISTANT wanted to assist in the Out-patient Department two mornings per week. Applications are invited for the above appointment. Candidates must be duly qualified. Women eligible. Salary £50 per annum. Applications to be sent to the Hon. Secretary of the Medical Board.

Wanted, at the Cheshire County Asylum, Parkside, Macclesfield, a Temporary ASSISTANT MEDICAL OFFICER

for the duration of the war. Must be ineligible for Military Service, or a Woman under thirty-five. Previous experience not necessary. Salary 7 guineas per week, with apartments, board, and washing. Apply to the Medical Superintendent.

Manchester Education Committee.—

Wanted, an ASSISTANT SCHOOL MEDICAL OFFICER (Man or Woman). Salary (according to qualifications and experience), £350 to £500 per annum, together with £10 per annum for travelling expenses.

Particulars of duties may be obtained by sending stamped envelope to the undersigned.

Applications must be received not later than July 15th, 1918.

Canvassing members of the Committee will be a disqualification.

SPURLEY HEY, Director of Education.

Education Offices, Deansgate, Manchester.

West Kent General Hospital, Maidstone.

—The following appointments will immediately become vacant:—

One SENIOR HOUSE SURGEON at a salary of £250 per annum.

One JUNIOR HOUSE SURGEON at a salary of £125 per annum.

Applications for either of these appointments should be sent not later than 18th instant to the undersigned, from whom further particulars may be obtained.

1st July, 1918. H. ST. JOHN WOOD, Secretary.

Great Northern Central Hospital, Holloway, London, N.

—Applications are invited for the post of CASUALTY OFFICER. Male or Female (Male candidates must be ineligible for Military Service). The appointment is for six months, with salary at the rate of £200 per annum, with board, residence, and laundry.

Particulars and forms of application may be obtained from the undersigned.

Applications, and copies of testimonials, should be sent as soon as possible to GILBERT G. PANTER, Secretary.

Assistant Resident Medical Officer.—

The Committee of Management of the HOSPITAL for CONSUMPTION and DISEASES of the CHEST, Brompton, invite applications for the post of ASSISTANT RESIDENT MEDICAL OFFICER. Salary £100 per annum, with board and residence. Candidates must be registered practitioners, and must have held a resident hospital appointment for six months.

Applications, with testimonials, to be sent in on or before Tuesday, July 23rd. Further particulars may be obtained at the Hospital.

Brompton, July, 1918. FREDERICK WOOD, Secretary.

Evelina Hospital for Children, Southwark, London, S.E.

—The Committee of Management requires a HOUSE PHYSICIAN and a HOUSE SURGEON from 12th July; former for four months, latter for three months. Salary at rate of £160 per annum, with board, residence, and washing.

Candidates (either sex) should send applications, with three testimonials (copies only), to the Secretary, at the Hospital, before the 9th inst.

Applicants (qualified and registered) must be interviewed by the Medical Committee. Selected candidates have to appear before the Committee of Management. Time and place of meeting will be notified by the undersigned, from whom rules and other particulars relating to the post must be obtained.

By order of the Committee of Management,

1st July, 1918. H. C. STANILAND SMITH, Secretary.

The Hospital for Sick Children, Great Ormond-street, London, W.C. 1.

—A HOUSE SURGEON is required on the 24th July, 1918.

Candidates, Male or Female, are invited to send in their applications, addressed to the Secretary, as soon as possible, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible hospital appointment.

The appointment is made for a minimum period of six months. Salary at the rate of £100 per annum, washing allowance £5 per annum, and board and residence in the Hospital.

Candidates must possess a legal qualification to practise, and be ineligible for Military Service.

Candidates may be required to attend before a meeting of the Joint Committees.

Forms of application can be obtained from the Secretary.

By order of the Committee of Management.

June, 1918. JAMES MCKAY, Acting Secretary.

University of Bristol.—Council invite

applications for LECTURESHIP IN DENTAL MECHANICS. Further particulars may be obtained on application to the Registrar.

Queen Mary's Hospital for the East End, Stratford (179 beds).

—Wanted, HOUSE SURGEON. Applications must be addressed to the undersigned. Male applicants must be eligible for Military Service.

A. W. SCRIVENER, Secretary.

University of Birmingham.—Faculty of Medicine.

—SENIOR DEMONSTRATORSHIP IN ANATOMY.—Applications are invited for the post of Senior Demonstrator of Anatomy. Stipend commencing at £250 per annum, and rising by annual instalments to £300. Applications, with testimonials, should be sent to the undersigned, from whom further particulars may be obtained. GEO. H. MORLEY, Secretary.

The Gloucestershire Royal Infirmary and EYE INSTITUTION (140 beds).

—Applications are invited for the posts of FIRST and SECOND HOUSE SURGEONS. Salaries: First House Surgeon at the rate of £175 per annum; Second House Surgeon at the rate of £150 per annum. With board, residence, and laundry.

These appointments are open to Senior unqualified Students.

Applications, with testimonials, to be forwarded to the Secretary at once.

Gloucester, June 27th, 1918. HARRY P. PIKE, Secretary.

City of Manchester.—Second Assistant Medical Officer to the BAGULEY SANATORIUM for Tuberculosis.

—The Sanitary Committee require the services of a fully qualified Medical Officer, with experience in the treatment of Tuberculosis, to act as LOCUM TENENS.

Applicants must be unmarried, ineligible for Military Service, and conversant with bacteriological methods. The salary will be £400 per annum, with board and residence.

Applications, stating age, qualifications and experience, and endorsed on the envelope "Second Assistant Medical Officer, Baguley Sanatorium," must be addressed to the Town Clerk only, and not to members of the Committee or Council, not later than July 10th, 1918, and be accompanied by not more than three recent testimonials.

Canvassing in any form, oral or written, direct or indirect, is prohibited. THOMAS HUDSON, Town Clerk.

Town Hall, Manchester, June 24th, 1918.

Northamptonshire Sanatorium, Creaton, near Northampton.

—MEDICAL SUPERINTENDENT.—The Committee of the above institution (58 beds for the treatment of early cases of Tuberculosis) invite applications for the post of Medical Superintendent from single gentlemen ineligible for Military Service. The salary offered is £300 per annum, rising on approved service to £350 by annual increments of £25. Furnished quarters, board, and laundry provided in the institution.

Applications, stating age, qualifications, and previous experience, along with copies of three recent testimonials, endorsed "Medical Superintendent," should be sent not later than 16th July to the undersigned. A. CLIFFORD TOWERS, Secretary.

Drury Chambers, Market-square, Northampton, 1st July, 1918.

Swinton and Pendlebury Urban District Council.

—Appointment of Temporary (Woman) ASSISTANT MEDICAL OFFICER, for the duration of the War.—Applications are invited from duly qualified Medical Practitioners (Women) for the above post, to act under the direction of the M.O.H. The principal duties will be Medical Inspection of School Children and Maternity and Child Welfare Work.

The person appointed will be required to devote the whole of her time to the duties of the office.

Preference will be given to candidates who have had special opportunities for studying Diseases of Children and special diseases of the Eye, Ear, Nose, and Throat.

Salary £450 per annum

Applications, with particulars of qualifications, and accompanied by three copies of recent testimonials endorsed "Assistant Medical Officer," to be sent to the undersigned at once.

W. T. POSTLETHWAITE, Clerk to the Council.

Council Offices, Swinton, Manchester.

Bristol Education Committee.—

SCHOOL MEDICAL SERVICE.—The Bristol Education Committee invite applications for the appointment of a Lady ASSISTANT SCHOOL MEDICAL OFFICER, who will be required to devote her whole time to her duties. These will include medical work in the Public Elementary Schools, work in School Clinics and in Special Schools, and such other duties in connection with the School Medical Service as may be allocated.

Special consideration will be given to candidates who have held posts in General or Eye Hospitals, or who have had previous experience in Diseases of Children. Salary £350 per annum.

Applications should be received not later than noon on Monday, 22nd July, and must be made on forms obtained from the undersigned, from whom details as to the appointment may be ascertained. Envelopes should be endorsed "Assistant School Medical Officer."

Canvassing for which the Committee may consider the candidate directly or indirectly responsible will disqualify.

WM. AVERY ADAMS, Secretary for Education.

Guildhall, Bristol, 2nd July, 1918.

Royal Berkshire Hospital (264 beds with Military Section).—Wanted, HOUSE SURGEON, who must be fully qualified and on the Medical Register. Salary £250 per annum, with lodging, board, and washing. There is a Senior Resident Medical Officer. The appointment is for six months.

Applications with copies of three testimonials, should be addressed to the undersigned, of whom any further information may be obtained.

Reading, 3rd July, 1918. HERMAN BURNEY, Secretary.

Royal Berkshire Hospital (264 beds with Military Section).—Wanted, HOUSE PHYSICIAN, who must be fully qualified and on the Medical Register. Salary £250 per annum, with lodging, board, and washing. There is a Senior Resident Medical Officer. The appointment is for six months.

Applications, with copies of three testimonials, should be addressed to the undersigned, of whom any further information may be obtained.

Reading, 3rd July, 1918. HERMAN BURNEY, Secretary.

Hampstead General and North-West LONDON HOSPITAL.—CASUALTY OFFICER.—Applications are invited from duly registered Practitioners for the post of Casualty Officer. The salary will be at the rate of £150 per annum, together with board, residence, &c. The appointment will be for a period of six months.

Applications, stating age and qualifications, together with copies of three testimonials, should be addressed to the Secretary, at the Hospital, not later than the 17th inst.

Haverstock-hill, N.W., July 3rd, 1918. HAROLD WIGG, Secretary.

Parish of St. Pancras.—Guardians of THE POOR.—The Guardians of the Poor of this Parish invite applications from duly qualified Medical Practitioners for the position, which will be vacant at the end of July, of ASSISTANT MEDICAL OFFICER of the House and South Infirmary, Pancras-road, N.W., with salary at the rate of £300 per annum, with the usual residential allowances.

Further particulars as to the terms and conditions of appointment may be obtained from the Medical Superintendent, at the Infirmary. Applications may be made upon forms to be obtained at my office as below by forwarding a stamped addressed foolscap envelope.

J. E. P. HALL, Clerk to the Guardians.

Town Hall, Pancras-road, N.W.1, 2nd July, 1918.

Walsall Education Committee.— SCHOOL MEDICAL SERVICE.—The Committee require the services of a qualified LOCUM TENENS (Man or Woman), their School Medical Inspector having joined H.M. Forces.

Salary at the rate of £400 per annum.

Applications should be forwarded to the undersigned.

ARTHUR HIBBETT, Secretary.

Education Offices, Council House, Walsall, 22nd June, 1918.

Nottingham City Asylum. — Locum TENENS wanted (Male) for about two months from the middle of July. Candidates must be registered under the Medical Act. Salary £7 7s. per week, with apartments, board, and laundry. Apply, stating age and other particulars, and enclosing copies of recent testimonials, to the Medical Superintendent.

County Council of the West Riding OF YORKSHIRE.—MATERNITY AND CHILD WELFARE.—The Council invite applications for the appointment of a LADY MEDICAL PRACTITIONER for the purposes of their Maternity and Child Welfare Scheme, at a salary of £400 per annum, who will act under the direction of the County Medical Officer. Candidates must have had special experience in connection with Maternity and Child Welfare Work.

Application forms, with further particulars, which can be obtained from the undersigned, must be received, accompanied by not more than three recent testimonials, not later than 22nd July, 1918.

FRANCIS ALVEY DARWIN,
Clerk of the County Council of the West Riding of Yorkshire.

The Guest Hospital, Dudley (115 Beds).—Appointment of MATRON.—The Committee invite applications for the post of Matron, at a salary of 100 guineas per annum, together with board, furnished apartments, and washing.

Candidates must be fully trained Nurses, certificated, have had experience in housekeeping, and the management and training of a nursing staff.

Applications, stating age (which must not be over forty years), where trained, previous experience, and enclosing copies of six recent testimonials, to be sent to the Chairman of the Committee not later than Thursday, July 18th, 1918. ARTHUR BIRD, Secretary.

The Guardians of the Poor of the PARISH OF ST. GILES, Camberwell, require the services of a duly qualified and registered Medical Practitioner to act as LOCUM TENENS for the Medical Officer to their Constance-road Institution, East Dulwich, S.E., for the period 14th August to 4th September.

The inclusive remuneration will be after the rate of £3 3s. weekly, with board, lodging, and washing, all fees received by or becoming payable to the Locum Tenens during the period to be paid over to the Guardians.

Forms of application can be obtained by forwarding a stamped, addressed foolscap envelope, or by personal application here, and the same must, when duly completed, be returned to me at once.

Canvassing the guardians, either directly or indirectly, is prohibited, and will disqualify any candidate.

CHARLES S. STEVENS, Clerk to the Guardians.

Guardians' Offices, 29, Peckham-road, S.E. 5, June, 1918.

Lady Medical Officer wanted for a Munition Factory in the Midlands. Salary £350 with a small panel. Apply, the Director, Welfare and Health Section, Ministry of Munitions, Whitehall Gardens, S.W.1.

Royal Albert Hospital, Devonport.— Wanted at once HOUSE SURGEON. Salary at the rate of £200 per annum, with board, residence, and laundry. Candidates must be fully qualified. Applications to Chairman, Selection Committee.

Surgeon required for Steamer in Transport Service. Wages £20 per month and 10% bonus.—Write, J. 256, care of Shelley's, 38, King William-street, E.C.4.

Ship's Surgeon. — Messrs. Elder Dempster and Co., Limited, have a few vacancies for Surgeons in their West African Service. Pay £20 per month. Fees allowed for attendance on passengers. Length of voyage varies from six to ten weeks, according to particular route.—Apply, Medical Superintendent, Messrs. Elder Dempster and Co., Limited, Colonial House, Liverpool.

Wanted, position as Locum where could take wife and boy aged three. English, ineligible, L.R.C.P.& S.E. Excellent references.—State terms, No. 703. THE LANCET Office, 423, Strand, W.C.2.

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South Coast.—Urgent.—Over £1300 a year.—Same hands over thirty years. Easily worked. No car needed. No night work. M.O.H. Parish, Admiralty and other appointments. Panel 850. Large house, eight bedrooms, shady garden. Great scope. Premium moderate.—Apply, No. 6298, care of Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

For Disposal, Practices or Partnerships.—Messrs. ARNOLD & SONS, Surgical Instrument Manufacturers, have been instructed to privately dispose of a large number of really good Practices and Partnerships. Gentlemen are requested to state their requirements and amount of capital available. No charge to purchasers.—Address, Arnold & Sons, Transfer Dept., 6, Giltspur-street, London, E.C. 1 (opposite St. Bartholomew's Hospital).

For Disposal.—London.—Panel over 1500, and private practice making up about £1100 a year. Middle- and working-class patients. Premium £900, part by instalments.—Apply, No. 6295, care of Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

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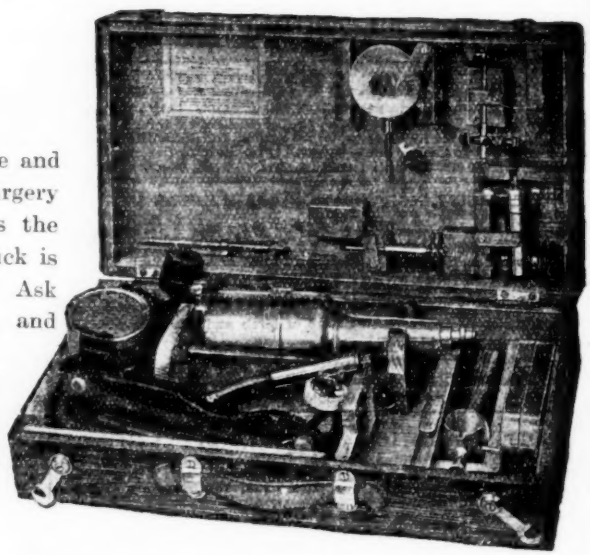

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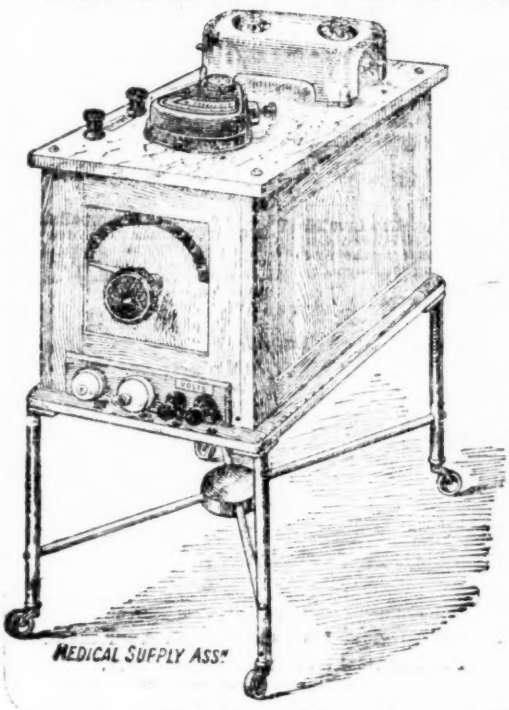

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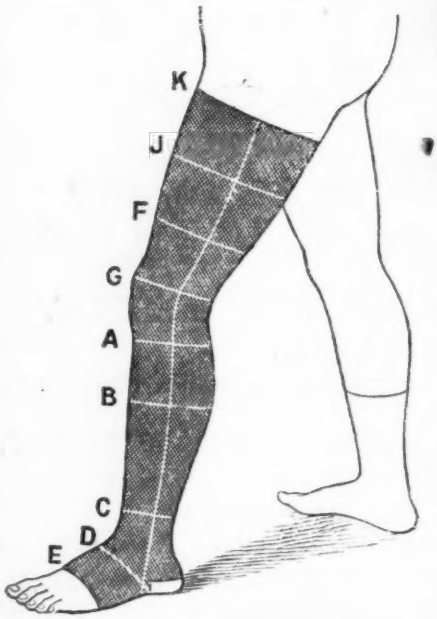

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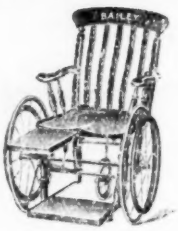

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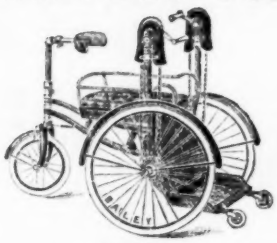

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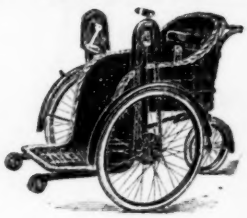

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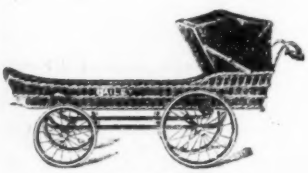

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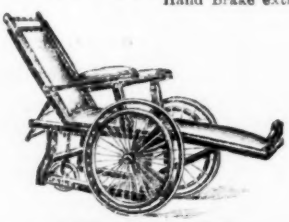

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